

Climate Change and Structural Emissions: Moral Obligations at the Individual Level

by Monica Aufrecht

ABSTRACT

Given that mitigating climate change is a large-scale global issue, what obligations do individuals have to lower their personal carbon emissions? I survey recent suggestions by Walter Sinnott-Armstrong and Dale Jamieson and offer models for thinking about their respective approaches. I then present a third model based on the notion of structural violence. While the three models are not mutually incompatible, each one suggests a different focus for mitigating climate change. In the end, I agree with Sinnott-Armstrong that people have limited moral obligations to directly lower personal emissions, but I offer different reasons for this conclusion, namely that the structural arrangements of our lives place a limit on how much individuals can restrict their own emissions. Thus, individuals should focus their efforts on changing the systems instead (e.g., the design of cities, laws and regulation, etc.), which will lead to lower emissions on a larger scale.

Bio

Monica Aufrecht teaches philosophy in Seattle. She has taught environmental ethics and philosophy of science at Linfield College in McMinnville, Oregon, as well as at Simon Fraser University in Vancouver, B.C., while helping establish the Institute for Values in Policy and Science. She was a Research Fellow at the Max Planck Institute for History of Science in Berlin. Dr. Aufrecht received a PhD in philosophy from the University of Washington in Seattle.
aufrecht@uw.edu

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1. INTRODUCTION¹

In debates between deontological and consequentialist moral approaches, the question arises: Should one keep one's self pure regardless of the actions of others, or should one wade into the mess to ensure the most just outcome? Should I tell the truth to the murderer at the door and let him decide how to act, or I should lie to him to save my friend? This puzzle is echoed in recent debates about mitigating climate change. Should I limit my own personal emissions regardless of how much everyone else is polluting? Or should I aim to reduce total global emissions even if that means increasing my own emissions to do it, just as Al Gore flies around the world making presentations about climate change?

In this paper, I focus on two authors who agree that one should aim to limit total global emissions.² As utilitarians, they agree that the moral action is that which brings about the best outcome, which in this case means mitigating climate change by limiting total carbon emissions. Interestingly, they disagree on the best way to bring about that change.³ Walter Sinnott-Armstrong has recently argued that since it is hard to trace the causes of climate change to any one individual, it appears that individuals have little obligation to limit personal emissions but rather should focus efforts on large-scale political change. By contrast, Dale Jamieson proposes that individuals do have obligations to directly limit emissions. He maintains that one's actions should be non-contingent; one should not wait to see what everyone else is doing, but rather strive now to limit one's own emissions regardless of the high emissions of others. Such focus on the self rather than on the political scale will have the effect needed, he argues, because

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we are social creatures; such an embodiment of “green virtues” can serve as a role model to influence others, thereby creating the large-scale effect needed.

I suggest that the two authors are using different models for characterizing climate change. I offer a third model, which leads to a conclusion similar to Sinnott-Armstrong’s, but based on different reasons. I draw from the notion of “structural violence” to illustrate how infrastructures in the U.S., such as food distribution and housing, leave limited room for personal choice when it comes to emissions. Structural violence offers a model in which harm is due to the structures of social institutions; blame or cause of the harm cannot be traced to any one individual. Such a model can help avoid some of the puzzles in Sinnott-Armstrong’s account. Thus, I offer different reasons to support Sinnott-Armstrong’s conclusion that one should focus efforts on large-scale change rather than individual responsibility.

2. SINNOTT-ARMSTRONG – THE THRESHOLD MODEL

In his paper “It’s Not *My* Fault: Global Warming and Individual Moral Obligations,” Walter Sinnott-Armstrong⁴ recognizes that unless everyone acts, individual efforts to reduce emissions will have little direct effect on climate change. Given that, what are the moral obligations of one person to reduce her own personal emissions? He surveys and rejects several reasons to think one has moral obligations to limit one’s personal emissions in such a situation. He concludes that while one does have obligations to urge larger institutions such as governments to limit total emissions, one has no obligations to change one’s personal life to limit one’s own emissions. He offers several arguments for this, but here I will focus on just a few.

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Sinnott-Armstrong recognizes that if a person's actions cause harm, then she has a reason not to act. However, he argues, there is no sense in which my personal emissions *cause* global warming.⁵ Nor, he continues, do my actions cause the resulting weather patterns that make up climate change: "No storms or draughts or heat waves can be traced to my individual act of driving" (291). He writes that a single act of driving (or even a lifetime of driving!) is not a sufficient condition for climate change, since one person's driving will not by itself lead to climate change. Nor is it a necessary condition, since if one person stopped driving, climate change would still occur. Thus, the driving of one person does not cause climate change.

Sinnott-Armstrong considers two interpretations of what it means to cause climate change, and thus cause harm, in this case. One could cause harm by creating a problem that would not have been there otherwise, or one could exacerbate an existing problem. Sinnott-Armstrong concludes, however, that my emissions neither cause climate change nor make existing climate change worse. He writes,

The point is not that the harm I cause is imperceptible. I admit that some harms can be imperceptible because they are too small.... Instead, the point is simply that my individual joyride does not cause global warming, climate change, or any of their resulting harms, at least directly. (291)

Causing harms, even small harms, might give a person reasons to refrain from an action. In the case of climate change, however, Sinnott-Armstrong maintains that such reasons do not apply, since one person's emissions cannot cause climate change, nor make it worse. Yet he is not a skeptic about global warming. He fully believes that, collectively, human emissions of greenhouse gases is causing global warming, and will likely cause devastating climate change (286). So then what could he have in mind?

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We get a clue from an analogy he draws with five people pushing a car over a cliff. Suppose it takes just three people to push the car. If a sixth person were to join, he notes, the sixth person's actions are neither necessary nor sufficient to cause the car to go over the cliff (287).⁶ This analogy indicates that Sinnott-Armstrong might have in mind what I will call a Threshold Model. According to the Threshold Model, specific changes to weather patterns would require a certain threshold of emissions in order to occur. As total global emissions rise, there would be no effect on climate until a threshold level is reached. Once that threshold level of emissions is reached, then the resulting sudden rise in global temperatures would begin to cause negatives effects on climate.

Some might object, noting that there is still much debate about how total global emissions change the climate, and to what extent those changes are gradual and/or sudden. Even given these debates, however, there is still some sense in which weather changes are threshold events. Consider, for example, the common example of the theft of one grain of rice from someone who is hungry. The victim has been harmed a little bit through the loss of that one grain. By contrast, consider a storm. If a storm causes a loss of crops, then causing the storm would cause harm. However, if my carbon contributions are not enough to cause a storm, then no harm has been committed. To apply that to personal emissions, suppose that total emissions are well below some threshold level. In this case, even if my individual emissions cause tiny increases in global temperature (say, by breathing) my emissions could not result in the weather event. Now suppose that total emissions are above some threshold level (see Figure 1) and are causing a weather event. Now if I were to reduce my personal emissions, total global emissions (the solid arrow) would decrease a tiny bit. However, total emissions would still be above the threshold

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level of emissions, which presumably causes the event, so my actions would have no effect on reducing harm due to the event. According to the Threshold Model, changes to my personal emissions can neither cause nor mitigate the changes to the climate. Thus, Sinnott-Armstrong's Sunday driving for fun would be morally permissible.

Some might think this argument moves too quickly. As I interpret Sinnott-Armstrong, he avoids characterizing the situation as a typical sorites problem by seeing it as a case with sudden changes, rather than incremental changes. Still, it is not clear whether climate change is indeed such a case. Gradual increases in carbon emissions might indeed be causing small, gradual harms (slightly higher temperatures could affect crops incrementally, raise sea levels a little bit, etc.). Moreover, it is not clear that a threshold climate change situation absolves individual emitters of blame after all or if it simply adds new puzzles about causation and blame (for a related discussion, see Chrisoula Andreou's⁷ discussion on blame and action). My goal is not to address such issues here, but rather to note that there is a philosophically simpler path to get the same conclusion. First, however, let us look at an alternative suggestion. Sinnott-Armstrong acknowledges that an individual's personal habits might indirectly affect other people. Still, he argues that the results would still be minimal in the face of an overwhelming problem (292). Jamieson, however, places a much higher importance on the social context of our actions.

3. JAMIESON – THE LEAD-BY-EXAMPLE MODEL

Dale Jamieson⁸ agrees that the goal is to reduce the effects of climate change, presumably by reducing total global emissions. He also agrees with Sinnott-Armstrong

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that one individual's personal emissions have little *direct* effect on global warming and climate change. However, Jamieson argues that an individual's personal emissions do matter morally – they have a significant *indirect* effect on total global emissions.

Jamieson emphasizes that we are social creatures and are influenced by others. Anyone can serve as a role model, and if that person reduces his emissions, then other people will see him. Soon many people will be following his example and reducing their personal emissions. Finally, if many people reduce personal emissions, then together we can reduce global emissions (179). Here Jamieson argues that the best way to bring about the desired outcome is to model the desired behavior. Thus, in the case of global warming, personal emissions and personal habits, not just large-scale political change, become very important. One must set a good example by sticking to the virtuous action that reduces personal emissions (182).

While Sinnott-Armstrong focuses on the actions of one individual in isolation, Jamieson steps back to see how our actions influence each other. He argues that when faced with collective action problems such as climate change, one cannot wait for others to act, even if your action would have little effect by itself (172). This standoff is reminiscent of George W. Bush⁹ stating that the U.S. will not sign the Kyoto Protocol since India and China had not signed on.¹⁰ Jamieson argues that since someone must act first to break up the standoff, the morally right thing to do is be that first person: cut your own personal emissions.¹¹ Others will see your example and follow suit, resulting in a cascading set of actions that will bring down global emissions (see the dotted arrow in Figure 2). While Sinnott-Armstrong claims that my actions do no good if other people do not act, Jamieson focuses on the other side: my actions can do good if they can influence

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other people to act. Thus, Jamieson concludes, the best way to reduce total global emissions is, indeed, to reduce one's personal emissions; I should not wait to see what everyone else is doing, but rather do the virtuous thing and soon others will follow me.

4. STRUCTURAL EMISSIONS MODEL

I am drawn to Jamieson's argument that individuals can serve as role models, and I think it has great potential as a critique when applied to the Threshold Model.

Nonetheless, I propose that the Lead-By-Example Model has limits. Let us grant for the sake of argument that one person can serve as a role model, and that she can successfully influence everyone to reduce emissions. What would those reductions look like? The State of Washington Department of Ecology¹² recommends that citizens "Drive less, weather proof your home, change your lights, cut hot water usage" and so on. Yet will these changes be enough? Gerald Gardner and Paul Stern¹³ estimate that if everyone in the U.S. implemented these sorts of changes, U.S. carbon emissions could be reduced by 11%. Admittedly, this is a significant amount, and well worth pursuing, but alone it is not enough to mitigate the U.S. share of some of the worst effects of climate change. The U.S. needs to reduce annual emissions by 75% just to be at the global per capita average,¹⁴ and some bills have Congress setting sights on 80% reductions by 2050 to be in line with the Intergovernmental Panel on Climate Change recommendations for target global carbon levels.¹⁵

Thus there seems to be a limit on how much individual and household changes can affect nation-wide emissions. Timothy Gutowski¹⁶ has led recent studies on personal

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environmental impact, in which the authors incorporate infrastructures into their calculations. Once government services are accounted for, the authors write,

We identify a floor, below which environmental impacts for people living in the United States do not drop. For example, none of the life styles studied here ever resulted in an energy requirement below 120GJ (in 1997). This includes the life style of a five year old child, a homeless person and a Buddhist monk. While 120GJ is about one third the American average in 1997 (350GJ), it is almost double the global average energy use in that year (64 GJ). (172)

The environmental impact of a millionaire's lifestyle can be nearly ten times that of an average U.S. citizen, yet even citizens at the limiting floor consume twice what citizens globally consume because of the high energy¹⁷ set-up of current built-in government infrastructure (police, roads, libraries, etc.). Given these considerations, I would like to offer a third model for consideration, namely the Structural Emissions Model.

Many have noted that systems strongly influence individual choices. From Richard Thaler and Cass Sunstein's "nudges,"¹⁸ to incentives and economics systems, the structures that one encounters can shape one's choices. One particularly clear articulation of this appears in Johan Galtung's description of "structure violence."¹⁹ Galtung suggests that even when no single individual causes violence, a system can cause violence.²⁰ Paul Farmer²¹, among others, has built on this idea of structural violence by detailing how structures such as racism and poverty limit people's choices, and can lead to health problems and premature death. The notion of structures guiding people's lives is far reaching, and can be applied to many situations, including our choices around personal emissions. Structures are like roads in that they strongly guide the directions one can travel. Driving off-road might still be possible, but very few people do it.

Structures are also like roads in that they seem inevitable and unchangeable, and yet both

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can be changed with enough conscious effort, albeit not usually by one individual (an individual can lobby the city to have a new road put in, or to have a road removed, but she rarely builds a new road herself).

Sinnott-Armstrong offers a similar example when he suggests that mitigating climate change is analogous to repairing a bridge. While I agree with analogy, I offer different reasons to employ it. Sinnott-Armstrong argues that bridge repair is the job of the government and it is unreasonable to morally expect individual citizens to undertake the repairs themselves, even if they were capable of it (287). He uses the analogy to argue that governments and individuals sometimes have different moral obligations, so that even if a government has an obligation to mitigate climate change, it does not necessarily follow that individuals also have that obligation. By contrast, my use of the analogy is to show that certain paths can guide our actions without our realizing it, and it can be difficult to choose a different action without changing the direction of the path itself. Thus, it might not be possible for an individual to significantly reduce her carbon emissions without there being changes to the structures in her life.

The road or path is just a metaphor; an actual example of how structures limit or influence our choices would be a grocery store. When you walk into an upscale organic grocery store to buy milk, only certain kinds of milk will be available on the shelf. When you walk into a regular grocery store, different choices will be available. In many poorer neighborhoods around the United States there are no organic grocery stores nearby, so to buy organic milk one would have to make a special trip; very few people will do this. Thus, decisions by grocery chains on where to put their stores and how to stock their shelves place limits on what people can choose to buy.²²

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When we apply the notion of structures to carbon emissions, we see how individuals could fall short of making the necessary changes to global emissions. For example, in the U.S. many infrastructures are built around emissions, leaving limited room for personal choice. One can trade in for a smaller car, but many people cannot get rid of their cars entirely; given the communities where they live, there is no other way to get to work or to the grocery store.²³ One can try to be conscious about purchases, but there are many hidden environmental impacts associated with the products available for purchase in the United States.²⁴ Individuals can choose to install double-paned windows, but so long as they are living in freestanding houses, there will be a limit on how much they can reduce heating and cooling costs. Such homes are significantly less heat-efficient than small, clustered apartments in apartment buildings. The Structural Emissions Model directs us to think about changing the structures, not the individuals. In these cases, we would think about how to change the communities, for example bringing housing and commercial areas closer together; screening what products are available in stores and increasing oversight on imports; and building apartments and condominiums instead of houses.

Some solutions are small and easily implemented by private institutions, such as universities switching the default on their computer labs from screen saver to sleep mode. Other small and simple fixes are highly controversial, and must be put forward by governments to have any effect at all. Yet these structural changes could radically change the fight against climate emissions. For instance, changing the price at the pump to reflect the true cost of gas, which is currently estimated somewhere between \$8-\$10/gallon (incorporating negative externalities such as asthma, damage to water

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systems, war, etc),²⁵ would eventually lead to reduced individual trips, people moving closer to work, an increase in carpooling and demand for transit, etc.

Changing existing food subsidies is another structural change that is technologically simple but politically entangled. Reducing meat and dairy subsidies and increasing vegetable subsidies could influence market demand, thereby reducing methane emissions and other emissions related to the meat industry.²⁶ Alternatively, making available meat that is grown in a lab, rather than a farm²⁷ would change individual habits only minimally since low-emissions would be built into the product (though it would require a cultural shift).

Changes that are less controversial but much more involved include increasing the numbers of safe and protected bike lanes, such as those added in New York City, providing trams, subways and buses for transport, such as in Vancouver and Berlin, and adding curbside composting in addition to recycling in cities such as Seattle.

Ultimately, though, the best solutions will be at a scale that an individual can hope to influence: local communities. The debate, after all, is about the obligations of individuals to reduce global emissions. Individuals can affect their workplace, school district, university, neighborhood, local municipality, local businesses, etc.

For example, residents in Portland have constructed nearly a dozen co-housing communities where neighbors share walls, food, gardening, tools, large appliances (e.g., washing machines), and even solar panels. In another example, students could expand upon Fritz Haeg's model²⁸ and change their university lawns, with their high water consumption and mowing, into community gardens with rock gardens, local plants, and benches.

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Possible structural solutions range from the simple to the complex, from seamless shifts to radical cultural changes. The key is that the Structural Emissions Model focuses on changing systems and the communities in which individuals live, not the individuals themselves (at least not directly).

Even if the Lead-By-Example Model starts off successfully and one person can effectively influence a whole community to reduce its emissions, this is still not enough to mitigate climate change. If individuals must act within current structures, such as roads for single cars and freestanding houses, there will be a limiting floor to how much that community can reduce the total emissions (see the dashed arrow in Figure 3). While Sinnott-Armstrong argues that personal emissions play *no* role in increasing global emissions, and Jamieson argues that they play a significant role, I suggest they can play only a limited role. Thus, one should focus on changing the structures in which one lives, which will indirectly reduce total emissions, rather than focus on directly reducing one's own personal emissions.

5. DIFFERENT MODELS, DIFFERENT FOCUS

One might note that the three models do not necessarily contradict; one could reduce personal emissions and inspire one's community while still working toward structural change. As Jamieson notes, even if the best solution for curbing emissions is at the governmental level, this does not absolve individuals from action. If the state is not acting, individuals must step in (170). I agree -- to the extent that the models do not

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contradict, one should employ both: work to reduce personal emissions within existing structures, while also working to change the structure. However, the Lead-By-Example Model encourages one to stick to “green virtues” in order to be an effective role model. I contend that this strict behavior comes at a cost.

First, each model focuses one’s attention in a different direction for how to step in. For an individual hoping to fulfill his moral duty to mitigate climate change, the Threshold Model recommends that he put aside worries about his own life and focus on large-scale political action. Presumably the Threshold Model would lead one to think about the main national debates surrounding climate change, such as the details of the Kyoto Protocol, the relative merits of a cap & trade system versus a tax, changes to building codes, and economic incentives. Many of these conversations have focused on technical fixes that maintain current lifestyles, such as increasing efficiency and developing new energy sources. The Structural Emissions Model draws attention to the potential of the local level, as well. Effective structural change can occur in cities and local communities, though both government and grassroots action. Thus, the Structural Emissions Models leads one to ask the same questions as under the Threshold Model. However, this model also emphasizes questions about lifestyle changes and the significant redesign of cities, in the spirit of Arne Næss, Buckminster Fuller, or, more recently, Mitchell Joachim²⁹. Both models focus attention on the big picture and on changes that would affect whole communities at once, while the Structural Emissions model also focuses on the potential of cultural and lifestyle changes.

By contrast, under the Lead-By-Example Model, one’s focus would turn inward to one’s own life: Which light bulb to buy? What is the best way to bike to work?

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Where is the farmer's market? In general, these are good questions to be asking.

Personal habits certainly can make a difference in energy use and therefore to carbon emissions³⁰. Yet even within the same physical structures, there is a question of efficiency. For example, under the Lead-By-Example Model, each person must make the effort to remember to bring her own bag to the store, rather than relying on the free disposable bags provided. By contrast, if there were no bags at the store (as used to be common outside of the U.S.), everyone has an immediate incentive to change their habits more quickly. This example highlights how the Structural Emissions Model invites us to look at social and legal influences as well as physical ones, and so can point towards more efficient methods than the Lead-By-Example Model alone.

Second, this example points to another concern. Given that current structures put a limiting floor on how much one can reduce emissions and given how challenging it is to change these structures, one might suggest that it would be easier to simply opt out of the system entirely. The suggestion would be that if everyone removed themselves from existing structures, we could reduce emissions even more. If you cannot move closer to work, ride your bike there anyway. If no local food is available, grow your own. I have two responses to this objection. The first is about feasibility; while changing existing structures is difficult, encouraging the majority of well-off U.S. citizens to voluntarily opt out of the structures (to "drive-off road") could be even harder. The proposal requires such a radical change that "role models" might be hailed as saints (at best) or derided as deviants (at worst). In neither case, would they be followed. It seems to me that attempts to change existing structures, as difficult as that sounds, would be more likely to succeed than attempts to lead by example. The second worry is conceptual. There are many

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things (power plants, clothing production) that are presumably more efficient on a moderately large scale. If we truly succeeded in getting people to live outside existing structures, would these new lives be more efficient than those within the structures? If not, then one has missed the original intention, which was to reduce carbon emissions. If so, then one has actually succeeded at the original intention, which is to change the structures in which one lives, and replace them with new ones. In either case, the Structural Emissions Model provides a useful guide for thinking about our interactions with current structures.

Finally, there might nonetheless arise cases where the two models conflict. Suppose I need to work long hours promoting a new government initiative outlawing Styrofoam take-out containers. I can either order take-out so that I can stay up all night, or I can stop to cook my own food. The Lead-By-Example Model encourages one to maintain personal integrity to set a good example (cook one's own food), while the Structural Emissions Model encourages one to keep an eye on the big picture (focus one's time on the initiative).³¹ Although this specific case might be a false dichotomy, it nonetheless illustrates my point: in cases of conflict, the Structural Emissions Model encourages individuals to work toward big, systemic change, even if it means violating "green virtues" in the short run. While an individual can absolutely work for both personal and structural change at the same time, I suggest the priority should be on changing structures.

6. CONCLUSION

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I suggest we read Walter-Sinnott Armstrong as offering a Threshold Model of personal emissions. This model suggests that one has a moral obligation to focus on governmental and political changes, such as enacting laws to reduce total global emissions, rather than on reducing one's personal emissions. By contrast, Dale Jamieson appears to offer a Lead-By-Example Model, which focuses on personal change. Jamieson agrees that one's personal emissions have little direct effect on global warming, but he argues that one cannot wait for everyone else to reduce their emissions. One has a moral obligation to act to break up the standoff and to serve as a role model, thereby *indirectly* reducing total global emissions.

However, the Threshold Model might seem implausible because of its reliance on a controversial causal analysis, and I suggest reasons to think the Lead-By-Example Model will be insufficient for the changes needed. I propose a third model, which I call the Structural Emissions Model. This model focuses on intermediate changes, such as local and city changes, in addition to larger political changes. The physical and political structures in which one lives limit how much one can reduce personal emissions. Thus one has moral obligations to change the structures in which one lives, rather than to just directly reduce one's personal emissions within a given structure. Changing the structures, in turn, will indirectly reduce personal emissions by much more than is possible under the Lead-By-Example Model alone.

Moreover, according to the Structural Emissions Model, harm is due to the structures of physical and social institutions; blame or cause of the harm cannot be traced to any one individual. Yet, according to structural models, you have an obligation to act anyway, even if you did not cause the harm. Thus the Structural Emissions Model avoids

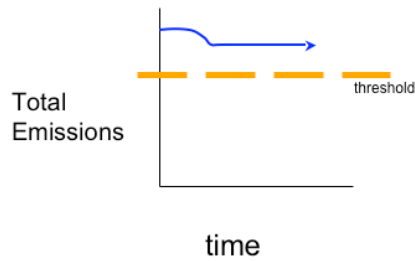
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the puzzle from the Threshold Model as to whether an individual causes climate change, and provides a different reason to support Sinnott-Armstrong's conclusion: if reducing our *aggregate* emissions through personal change alone is not enough to drop total emissions below needed levels, then Sinnott-Armstrong is right that reducing our personal emissions should not be the main focus. Even if a modest reduction can lessen some of the effects of climate change, one still has an obligation to try to reduce aggregate emissions even more than is possible under the Lead-By-Example Model. I suggest that these reductions can be achieved through structural changes. Thus, although I offer different reasons, in the end I agree with Sinnott-Armstrong that one has moral obligations to focus one's efforts on a larger scale to reduce total global emissions, rather than on directly limiting personal emissions. Let's not be penny-wise and pound-foolish.

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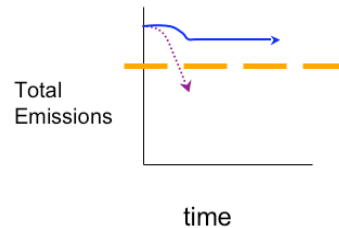
FIGURES

Figure 1: Threshold Model



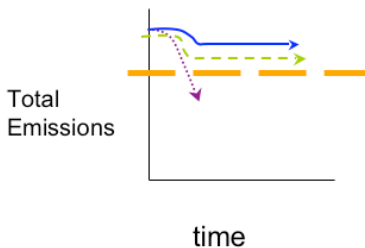
According to the Threshold Model, changes to my individual emissions will not be enough to mitigate climate change, and so they are not morally required.

Figure 2: Lead-By-Example Model



*According to the Lead-By-Example Model, changes to **aggregate** individual emissions appear sufficient for mitigating climate change, and changes in my individual emissions can inspire other individual emissions changes, so changes in my individual emissions are morally required.*

Figure 3: Structural Emissions Model



According to the Structural Emissions Model, once again changes to my individual emissions will not be enough to mitigate climate change. Other actions are morally required of me, but for reasons different from those in the Threshold Model.

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Endnotes

¹ I am grateful to Ben Almassi, Chrisoula Andreou, Stephen Gardiner, Sara Goering, Julie Homchick, Michael Libes, Emily Lynch, and Janelle Taylor for invaluable discussions and feedback, as well as to participants of the 2009 Communicating the Environment conference and the 2010 Association of Practical and Professional Ethics conference.

² In keeping with the parameters of the debate, I will focus on carbon dioxide emissions. I will also limit my discussion to the moral obligations of people in the middle- and upper-classes of the United States. The moral obligations of other members of the global community might look very different once further issues of justice are taken into account.

³ I owe this way of framing the debate to Stephen Gardiner.

⁴ Sinnott-Armstrong, W. 2005. “It’s Not My Fault”: Global Warming and Individual Moral Obligations’. *Perspectives on Climate Change: Science, Economics, Politics, Ethics*. Ed. W. Sinnott-Armstrong and R. B. Howarth. *Advances in the Economics of Environmental Resources*. 5: 285-307. Re-printed in *Climate Ethics*. Ed. D. Jamieson, S. Caney, S. Gardiner, and H. Shue. Oxford University Press, 2010.

⁵ Sinnott-Armstrong distinguishes between “global warming,” which refers to a rise in temperature, and “climate change” which refers to abrupt new weather patterns that result from global warming. For my purposes, these differences are less important, but I will follow his example.

⁶ Interestingly, Sinnott-Armstrong finds the sixth person blameworthy, but not the person emitting carbon, since the latter is not 1) intending to cause climate change and 2) his actions are not unusual compared to the rest of the population. These arguments deserve more attention, but I will not be able to address them here.

⁷ Andreou, Chrisoula. 2006. ‘Environmental Damage and the Puzzle of the Self-Torturer’. *Philosophy and Public Affairs* 34(1):95–108.

⁸ Jamieson, D. 2007. ‘When Utilitarians Should Be Virtue Theorists’. *Utilitas* 19(2): 160-183. Re-printed in *Climate Ethics*. Ed. D. Jamieson, S. Caney, S. Gardiner, and H. Shue. Oxford University Press, 2010.

⁹ Bush, G. W. 2000. Debates Transcript. *Commission on Presidential Debates*. 11 October. <http://www.debates.org/index.php?page=october-11-2000-debate-transcript> (accessed 28 October 2011).

¹⁰ Similar sentiments have been expressed more recently by U.S. Senator Charles Grassley from Iowa and by U.S. Senator James Inhofe from Oklahoma, who said, “Unless supporters of cap-and-trade legislation can develop a plan to convince China and

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India to make meaningful emissions reductions on par with the United States, no such bill will pass the U.S. Senate.” Dempsey, Matt. 2009. ‘Inhofe: Lack of Action by Developing Nations Makes Senate Cap-and-Trade Bill “Meaningless”.’ U.S. Senate Committee on Environment & Public Works Press Release. July 8. <http://epw.senate.gov/public/> (accessed 17 September 2009). See also Charles Grassley. 2009. Transcription of Senator Grassley’s Ag News Conference Call. Official Website for Senator Chuck Grassley. 25 August.

http://grassley.senate.gov/news/Article.cfm?customel_dataPageID_1502=22644 (accessed 17 September 2009).

¹¹ For examples of other responses to climate change standoff arguments, see Gardiner, S. 2004. ‘Ethics and Global Climate Change’. *Ethics* 114(4): 555-600; and Shue, H. 1993. ‘Subsistence Emissions and Luxury Emissions’. *Law and Policy* 15: 39-59.

¹² Washington State Department of Ecology. 2009. ‘What You Can Do’. Olympia, Washington. <http://www.ecy.wa.gov/climatechange/whatucando.htm> (accessed 28 October 2011).

¹³ Gardner, G. and P. Stern. 2008. ‘The Short List: The Most Effective Actions U.S. Households Can Take to Curb Climate Change’. *Environment* 50(5): 12-25.

¹⁴ Energy Information Administration. 2009. *United States Department of Energy*. <http://www.eia.doe.gov/emeu/international/carbondioxide.html> (accessed 8 September 2009).

¹⁵ Intergovernmental Panel on Climate Change. 2007. ‘Mitigation of Climate Change’. *Fourth Assessment Report (AR4)*. Cambridge: Cambridge University Press; and Walsh, B. 2009. ‘What the Energy Bill Really Means for CO2 Emissions’. *Time*. 27 June.

¹⁶ Gutowski, T., A. Taplett, A. Allen, A. Banzaert, R. Cirinciore, C. Cleaver, S. Figueredo, S. Fredholm, B. Gallant, A. Jones, J. Krones, B. Kudrowitz, C. Lin, A. Morales, D. Quinn, M. Roberts, R. Scaringe, T. Studley, S. Sukkasi, M. Tomczak, J. Vechakul, and M. Wolf 2008. ‘Environmental Life Style Analysis (ELSA)’. *Electronics and the Environment. ISEE 2008 International Symposium*. 19-22 May.

¹⁷ Energy consumption is currently strongly correlated with carbon emissions (see note 12).

¹⁸ Thaler, R. and C. Sunstein. 2008. *Nudge: Improving Decisions about Health, Wealth, and Happiness*. New Haven: Yale University Press.

¹⁹ Galtung, J. 1969. ‘Violence, peace and peace research’. *Journal of Peace Research* 6(3): 167-191.

Climate Change and Structural Emissions: Moral Obligations at the Individual Level

²⁰ Note that non-violent structures might still have violent individuals existing in them. Galtung's point is simply that if you are working for peace, it is insufficient to focus on violent individuals or incidents while ignoring violent structures.

²¹ Farmer, P. 2003. *Pathologies of Power: Health, Human Rights, and the New War on the Poor*. Berkeley: University of California Press.

²² Of course, this currently works both ways, since what people buy can influence grocery store decisions. However, one could argue that it does not *have* to be that way. There is nothing inherent in the notion of a grocery store that it has to be run strictly for profit. For example, stores could decide to do a community service by providing an organic option, even if they know few of their customers will choose it. My point in this note is simply that current structures limit not only what is physically possible (what one can buy), but also what we think is conceptually possible (how stores must run); both of these can be changed.

²³ Krauss, C. 2008. 'Rural U.S. Takes Worst Hit as Gas Tops \$4 Average'. *New York Times*. 9 June.

²⁴ Weber, C. and H.S. Mathews. 2008. 'Quantifying the global and distributional aspects of American household carbon footprint'. *Ecological Economics*. **66**(1-2): 379-391; and

²⁵ International Center for Technology Assessment, "The Real Price of Gasoline," 1998. The estimate could rise significantly if it included cost of dealing with floods, loss of crops, refugees, and disease that are likely due to climate change. There are additional costs for driving as compared with using public transit, such as road construction, medical attention for collisions, loss of space for parking, etc.

²⁶ Tuomisto, Hanna and M. Joost Teixeira de Mattos. "Environmental Impacts of Cultured Meat Production." *Environmental Science and Technology*, 2011 45(14). P6117-6123.

²⁸ Fritz Haeg, Diana Balmori. 2008. *Edible Estates*. New York: Metropolis Books.

²⁹ Vanderbilt, Tom. 2008. 'The 2008 Smart List: Mitchell Joachim, Redesign Cities from Scratch'. *Wired*, **16**(10): 178-9.

³⁰ Socolow, R.H. 1978. *Saving energy in the home: Princeton's experiments at Twin Rivers*. Cambridge, Massachusetts: Ballinger Press.

³¹ Jamieson offers the example of driving to Oxfam meetings.