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Source: *The Journal of Speculative Philosophy*, Vol. 25, No. 1 (2011), pp. 64-97

Published by: Penn State University Press

Stable URL: <http://www.jstor.org/stable/10.5325/jspecphil.25.1.0064>

Accessed: 03-04-2018 22:51 UTC

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Climate Ethics: Structuring Deliberation by Means of Logical Argument Mapping

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One of the first things President Obama did after coming to office was the establishment of the Office of Public Engagement. As described on its Web site, this office “is the embodiment of the President’s goal of making government inclusive, transparent, accountable and responsible.” The Office of Public Engagement is supposed to “create and coordinate opportunities for direct dialogue between the Obama Administration and the American public, while bringing new voices to the table and ensuring that everyone can participate and inform the work of the President.”¹

As the president explained in his memorandum on transparency and open government, “Public engagement enhances the Government’s effectiveness and improves the quality of its decisions. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge.”² Indeed, knowledge is widely dispersed in modern societies. We find it not only in a growing number of scientific disciplines but also outside of academia in highly educated and skilled individuals and in local communities that know how policy decisions materialize “on the ground.”

For the scientific debate on “deliberative” or “participatory democracy,” President Obama’s initiatives are exciting news. Finally, so it seems, after

Jürgen Habermas (1989) complained nearly fifty years ago that in capitalist societies the critical discourse of the public as the foundation of democratic decision making tends to be marginalized by the politicking of lobbies, private interests, and administrations, we see an attempt to “establish a system of transparency, public participation, and collaboration,” as the president writes.³

From a theoretical point of view, the central idea of “deliberative democracy” can be summarized by a definition formulated by Andrew Smith:

Theories of deliberative democracy offer a vision of political decision making in which citizens are able to consider relevant matters from multiple points of view, critically converse with one another about options before them, and seek to enlarge their understanding of whatever matters are under scrutiny. These decisions are intended to be procedurally fair and, in the case of epistemic theories of deliberative democracy, to meet with widespread and uncoerced agreement precisely because they are improved in their epistemic quality. Under the best of circumstances, deliberation converges on the best available ideas on offer: on a presumably correct political decision.

(2007, 259)⁴

However, it is far from clear how large-scale deliberation and participation might be possible. There are at least two problems, one of *quantity* and the other of *quality*. Regarding the first one, Peter P. Swire, who was involved in the New Media team that operated the Web site change.gov during the Obama/Biden transition and developed whitehouse.gov, describes the challenge the administration is facing regarding the use of participatory Web 2.0 technologies as follows: the Obama/Biden “campaign learned how to cope with a motivated group of just over 10 million individuals. After Election Day, the transition and later the administration had to respond to the concerns of over 300 million Americans, as well as interested persons in other countries.”⁵ There is no question that participation poses an enormous challenge. How can it be possible to structure a huge amount of input without frustrating both overwhelmed politicians and potentially millions of engaged citizens?

The problem of the quality of deliberation becomes visible in case studies that looked at projects that are already well established. In one of these, Coelho, Pozzoni, and Montoya (2005) analyze the working and

efficacy of a “management council” in the municipal health system of São Paolo. The council has been set up according to the 1988 Brazilian Constitution, which “established mechanisms for citizens to participate in the formulation, management, and monitoring of social policies” (Coelho et al. 2005, 174). Half of the councilors in this study represented organizations from civil society, and the other half comprised health professionals and representatives of governmental institutions and of public and private providers of health services. Based on an analysis of the council minutes and interviews with councilors, the authors show that positions in the council deliberations were perceived as being more important and legitimate the more councilors were able to master the technical language of the health sector in a way that resonated with current policy discourses:

The tendency of citizen representatives to construct their arguments in a way that is regarded as unstructured, combined with their focus on highly localized issues, makes their speeches appear unclear, emotional, disruptive, or irrelevant to most representatives of the other sectors. Moreover, this style of speech tends to be associated with poorer and less educated people, and it is regarded as not only ineffective but also virtually unintelligible.

When debates were about important political issues, such as changes in administrative rules or health programs, numerous councilors found that the arguments they advanced failed to modify in any meaningful way the proposals advanced by the government. (2005, 181)

The conclusion the authors draw from this case study is clear: “To enable underprivileged groups to express themselves effectively in participatory forums, specific methodologies aimed at fostering the abilities of participants with less technical expertise and communicative resources need to be devised and adopted” (2005, 181). This corresponds exactly to an observation that John Dewey formulated already more than eighty years ago in *The Public and Its Problems*: “The essential need [today] is the improvement of the methods and conditions of debate, discussion, and persuasion. That is the problem of the public” (1946, 208).

The most basic method of deliberative discourse is argumentation. “Processes of deliberation take place in argumentative form,” writes

Habermas in *Between Facts and Norms*. “Deliberations are free of any external coercion,” but participants “are bound . . . by the presuppositions of communication and rules of argumentation” (Habermas 1996, 305). Arguments are crucial because only “the unforced force of the better argument” can guarantee the reasonableness of deliberation and thus the “legitimating force” of deliberative politics (Habermas 1996, 306, 304).

Based on these considerations, my goal in this article is to show how the problems of quantity and quality in deliberative discourse can be addressed by a method of argument visualization, called Logical Argument Mapping (LAM), which will be implemented in an interactive Web application: AGORA: Participate—Deliberate!¹⁶ The AGORA system will allow users all over the globe to construct arguments and argumentations in graphical form on the Web, to add objections or counterarguments against the reasons of given arguments, and to engage thus in deliberation. The overall goal is to provide a tool that can be used for two purposes: first, to make both deliberation and the analysis of positions and controversies more effective and efficient and, second, to spread the skills necessary to participate in reasoned dialogue, that is, the ability to understand the structure of an argument and to learn how to construct an argument, how to criticize its underlying assumptions, and how to improve it. LAM and the AGORA system should be useful in the following contexts:

- Public deliberation on a global, national, or local level
- Interdisciplinary and disciplinary debates on scientific problems
- Conflict management and analysis (Hoffmann 2005, forthcoming)
- Cross-cultural understanding and communication
- Education to develop the skills necessary for participating in the other contexts.

In order to show how LAM might be a useful tool to improve the quality of deliberation at the boundary between scientific debate and public deliberation, I want to focus here on an example from the field of “climate ethics.”¹⁷ It concerns the debate about the famous “Stern Review” on *The Economics of Climate Change*.¹⁸ The review was commissioned to Sir Nicholas Stern, former chief economist of the World Bank, by the U.K. government and launched at an international press conference in October 2006 attended by the prime minister and treasurer. The central message

of the review, publicized to a worldwide audience, is that “prompt and strong action is clearly warranted . . . to avoid the worst impacts of climate change.” The Stern Review justifies this claim—in contrast to the widely shared argument that decisive action to reduce greenhouse gases would be too costly and a threat to economic development—by arguing that “the benefits of strong and early action far outweigh the economic costs of not acting” (Stern 2007, xv).

This debate is partly about the question, mainly discussed in economics, of whether this last statement is indeed true but also about the ethical question of whether the review’s exclusive focus on a utilitarian cost-benefit analysis “diverts attention away from alternative approaches, away from ethical debates over harming the innocent, the poor and future generations, and away from the fundamental changes needed to tackle the very real and serious problems current economic systems pose for environmental systems,” as Clive Spash (2007, 704) puts it. This ethical question leads beyond the narrow boundaries of economics; it should be addressed in an interdisciplinary effort, and it seems to be clear that philosophers should participate in this debate. However, since climate change is obviously a global problem that will concern everybody on Earth, either by the effects of global warming or through the costs that have to be shouldered to avoid or to adapt to these effects, it is clear that this debate should be open to public deliberation and participation as well.

When we try to imagine a large-scale deliberation on the Web in which not only scientists from various disciplines but also citizens are able to participate, it becomes obvious that the biggest challenge is how to structure such a debate. To avoid endless repetitions of the same points, it must be absolutely clear what can be addressed where. The biggest advantage of using Logical Argument Mapping, in contrast to other argument visualization tools, is not only that LAM provides a graphical structure in which an entire discussion can be visible at a glance but also that this structure is organized in a logically consistent way.⁹ The system challenges the user to develop arguments that are logically complete so that everything that is relevant as a premise is visible. This way, the user sees all the assumptions that need to be acceptable to get a powerful argument, and he or she can provide further arguments for premises that need further support. At the same time, an opponent can criticize the “open ends” of an argumentation or can develop his or her own arguments to certain points, and any such objection can itself be criticized by further arguments. That means that a

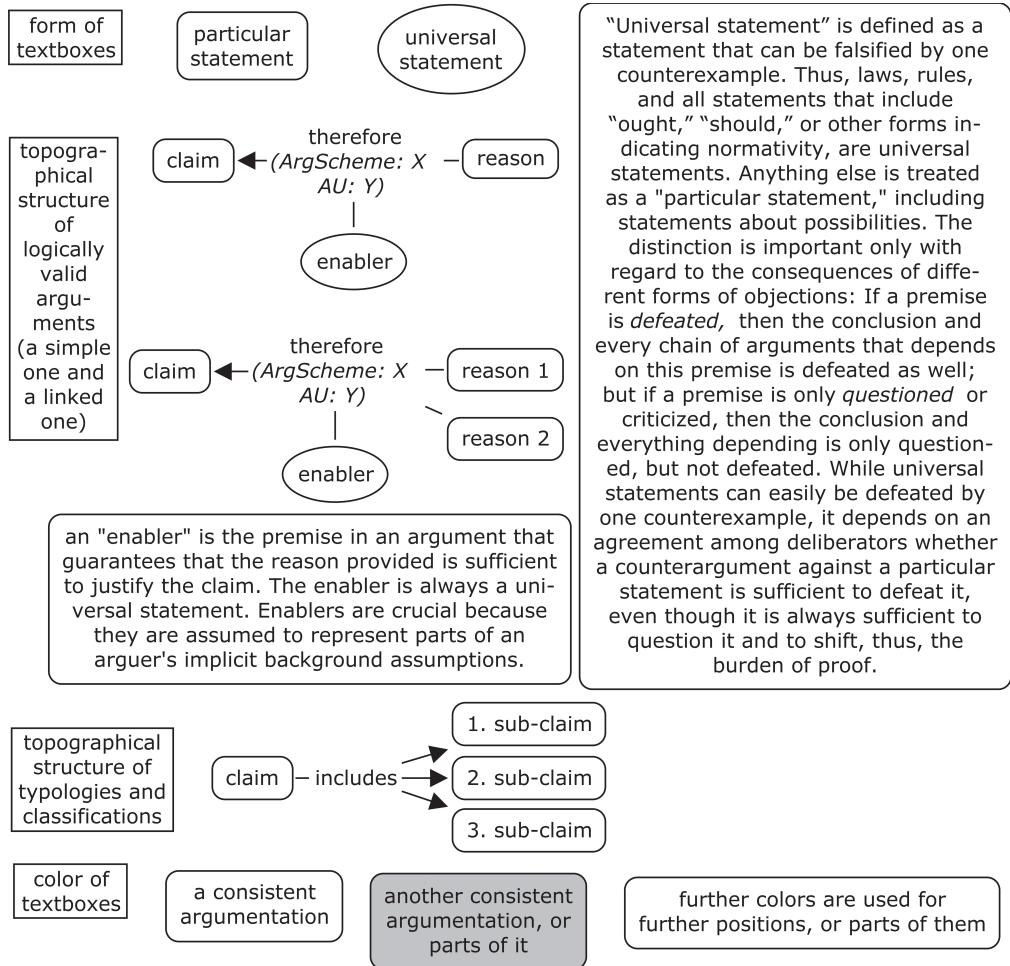
debate will unfold in a well-organized network in which everything has its clearly identifiable place.

The biggest problem with argument visualization tools is that we are not used to reading arguments that are represented in a two-dimensional space. We are so familiar with the linearity of texts that we feel pretty helpless when facing a map that can be approached in a variety of ways. Argument maps can be huge; the biggest ones I developed so far comprise up to 230 text boxes and measure, when printed in a readable size, up to four by six feet.¹⁰ To cope with the problem of readability it is necessary to establish certain conventions that facilitate efficient communication and interaction by means of argument maps.

The main goal of this article is to demonstrate the functionality of Logical Argument Mapping for structuring public and scientific deliberation by presenting and discussing some elements of an argument map that I created to visualize both the basic structure of the argumentation developed in the Stern Review and some of the disputes that arose around critical points of this argumentation. Since the structure of this large-scale argumentation extends well beyond the boundaries of a journal page, I have to refer those who are interested in seeing the whole thing to the Internet. In this article you will find only small pieces of the entire map, especially those that are relevant for the ethical dimensions of climate change policies.

There are two different maps on the Web that represent the Stern Review's argumentation. I would recommend starting with <http://tinyurl.com/y9jlsxv>. This map shows primarily the review's main argumentation stretching from the top-left corner—where you will find the conclusion already quoted—to the right side. On the right side of many of the text boxes in this map you will see little bent arrows in small squares. These are links to debates that arose with regard to the claims that are formulated in the respective text boxes. Click on these arrows to get access to further maps in which these debates are represented. The same arrows will bring you back from these submaps to the main map. The complete argumentation with all the objections and debates included is available on the second map at <http://tinyurl.com/y9ou8ef>.¹¹

Before we look at some pieces of this argument map it is necessary both to introduce the conventions according to which LAM maps should be read and constructed and to say a few words about the rules of Logical Argument Mapping. Whereas the conventions (see Figure 1) can be handled flexibly according to specific representational needs, the rules



layout convention the central claim of an argumentation is located at the top left corner of a map

the small arrows at the bottom of text boxes are links to arguments

the small icons at the bottom of text boxes are links to resources

"ArgScheme": "argument scheme." Refers here to a one of the logical valid schemes whose conclusion is necessarily true if all the premises are true

"AU": "author" (distinguishing authors is important for representing controversies)

FIGURE 1. Logical Argument Mapping conventions and definitions.

should be respected as a normative standard that is crucial for creating well-organized maps.¹²

There are only five simple rules. First, represent your main argument—and every subargument that might be controversial—according to an argument scheme whose deductive validity is evident or can be made plausible (e.g., modus ponens, modus tollens, disjunctive syllogism, conditional syllogism, and so on). Second, given that an argument is a set of statements that contains one claim and at least one reason, each of these statements should be formulated as one complete sentence and should be placed in one text box. Third, only descriptive or normative statements are permitted in an argument (no questions, for example). Fourth, consider the acceptability of all your premises and provide further arguments for those whose acceptability is either not evident or controversial. Fifth, revise the formulations of your statements and the structure of your argument for as long as it takes to create the best possible argument.

As usual, an argument is defined as a set of statements—a claim and one or more reasons—where the reasons jointly provide support (not necessarily conclusive) for the claim or are at least intended to support the claim. An “argumentation” is defined here as a set of arguments in which parts of a main argument are supported by further arguments. A logical argument is a logically valid (or “deductively valid”) argument. An argument is “logically valid” if and only if it follows an argument scheme that is logically valid. An argument scheme is logically valid if and only if it is impossible for any argument following this scheme to have true premises and a false conclusion. That is, logical arguments *are* conclusive arguments. Lists of logically valid argument schemes used in LAM are compiled in a manual that is available online.¹³

With regard to the conventions of LAM that are described in Figure 1, it should be useful to discuss a simple example. Let us assume that I claim with regard to a crime case, “Peter is responsible for what he did.” Asked to provide a reason for my claim, I could say: “Peter is a rational human being.” In order to map this simple argument according to the first rule of LAM as a logically valid argument, I would be challenged to provide additionally what I call an “enabler” (see Figure 1 for a definition).¹⁴ In this case, the enabler could be: “If someone is a rational human being, then this person is responsible for what he or she does.” If we combine these three elements of an argument—the claim, the reason, and the enabler—in

an LAM map, we would get the simple modus ponens argument that is depicted in Figure 2.

Although hardly anybody would use logically complete arguments in everyday argumentation, such an idealized construction is crucial because it reminds us that we have to reflect not only on the question whether the *reasons* we provide are acceptable and justified but also on the *inferential relation* between reason and claim as we, obviously, implicitly assume (because otherwise we simply would not provide something *as* a reason *for* a claim). Since the easiest way to represent an inferential relation is to represent the whole argument as a logically valid argument with the enabler representing the inferential relation, the first rule of LAM is justified as a methodological step to visualize what usually remains implicit. As Wesley Salmon noted already fifty years ago, the deductive argument “is designed to make explicit the content of the premises” (1963, 15). For me this means that the point in using only logical argument schemes is not the surely wrongheaded assumption that people reason in deductive form or would subscribe only to deductions; the point is that a reconstruction of any argument in logical form can show us how its premises would need to look like *if* the goal were to guarantee the truth of the conclusion. The point is to get the content of the premises right and to formulate them in their strongest possible form. The “exposure of the

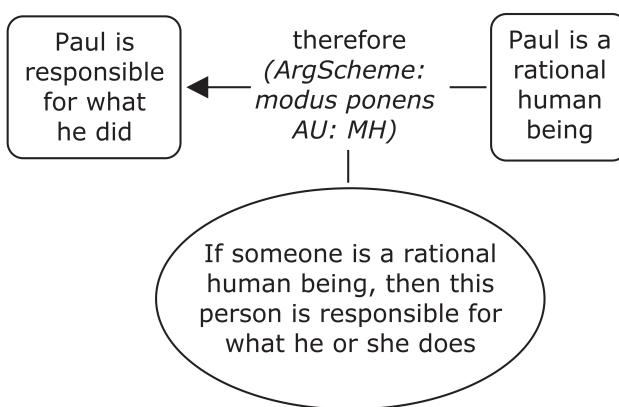


FIGURE 2. A simple Logical Argument Mapping argument. Everything that can be changed to improve the argument is visible.

foundations” of a claim facilitates critique, as Christoph Lumer (1988, 449) writes.

This methodological step is important because every argument can be attacked by two different strategies: by criticizing either one of the reasons or the inferential relation between reason(s) and claim. You might be ready to accept the truth of “Peter is a rational human being,” but it is possible that you do not accept the enabler “If someone is a rational human being, then this person is responsible for what he or she does.” As a counterargument against this enabler you might argue—for instance—that there is no free will or that rationality alone is not sufficient to constitute responsibility.

All these possibilities of attacks become immediately visible in the debate on the Stern Review’s argumentation. Before I turn to this debate, three points should be mentioned. First, any map can only represent a snapshot of an ongoing deliberation process at a certain time, not the process itself. Of course, it is possible to study the development of deliberations by analyzing the evolution of maps over time, but the maps I am discussing here are more like photographs of deliberation.

Second, although many of the reasons Stern provides in his argumentation are either questioned or defeated by various opponents—their counterarguments are signified by text boxes in a different color or shade of gray—this effect of their counterarguments is not reflected in the map. In the final AGORA system, any premise of an argument that is defeated, and any chain of arguments that depends on such a defeated premise, will be marked as defeated, thus clearly indicating to the proposer of the initial argument that something must be done to defend it. This way, any deliberator will always be challenged to refute upcoming counterarguments or to revise the original argumentation to defend it against objections. Once a defeating counterargument is itself defeated, the defeat marks on premises that were imposed based on the first-level counterargument will be removed. As Pollock (1992) puts it, the final conclusion of an argumentation can thus switch between “in” and “out,” that is, between “is not defeated” and “is defeated,” depending on the number of levels of counterarguments. (A further complication concerns the fact that a premise can be not only defeated but also “questioned,” which constitutes a weaker form of objection but also one that shifts the burden of proof.)

The third point to be mentioned concerns the fact that the argument maps I developed represent my own reading of some of the contributions

to the debate on the Stern Review. I am not an expert in many of the issues that are relevant here, and I am sure that everything in the map can be improved.¹⁵ However, the main function of Logical Argument Mapping is to stimulate reflection. My visualization of the structure of this debate provides only a starting point for others to continue and improve.

The so-called Stern Review has been written by a team of twenty-two scientists. The quotes in the maps refer to some chapters of the review as they are available online (Stern 2006a, 2006b, 2006c, 2006d, 2006e, 2006f, 2006g). The review's main argument is represented in Figure 3.

This map has been constructed according to the rules of LAM. That means that the two "enablers" directly underneath the "therefore" have been constructed by me so that they fit both to the reasons and the conclusion as they are quoted from the review and—in this case—to the argument scheme of modus ponens. Since both the arguments in this chain of arguments are logically valid, an opponent can only attack one of the "open ends" of this argumentation, that is, either one of the enablers or one of the two reasons on the right. (Of course, it would also be possible to attack directly the conclusion by a counterargument. But such a counterargument would always be questionable as long as there is a logically valid and undefeated argument *for* this conclusion. This way, an opponent is always challenged to take the reasons someone provides seriously.)

As becomes visible only in the complete map, the main task the authors of the Stern Review tried to accomplish is to justify the two reasons on the right by an entire network of further arguments (stretching to the right of Figure 3). Since I reconstructed all these arguments as logically valid arguments, the open ends of the Stern Review's argumentation that can be attacked are only those basic reasons and those enablers that are not further justified in the review. Based on the fact that most of the enablers are not even explicit, we can hardly find any justification for them.

As becomes visible in the online map, there is virtually no open end in the review's argumentation that has not been attacked. Some of the counterarguments of the opponents, however, can themselves be refuted by second-level counterarguments (partly based on arguments already provided in the review), and some of those again can be attacked on a third level. But the main point that is important for justifying Logical Argument Mapping as a method that can improve the quality of even large-scale deliberations like this one is that the normative standard of LAM allows structuring a debate in a way that any objection and any counterargument can clearly be located at a certain point in these maps. There are no free-floating

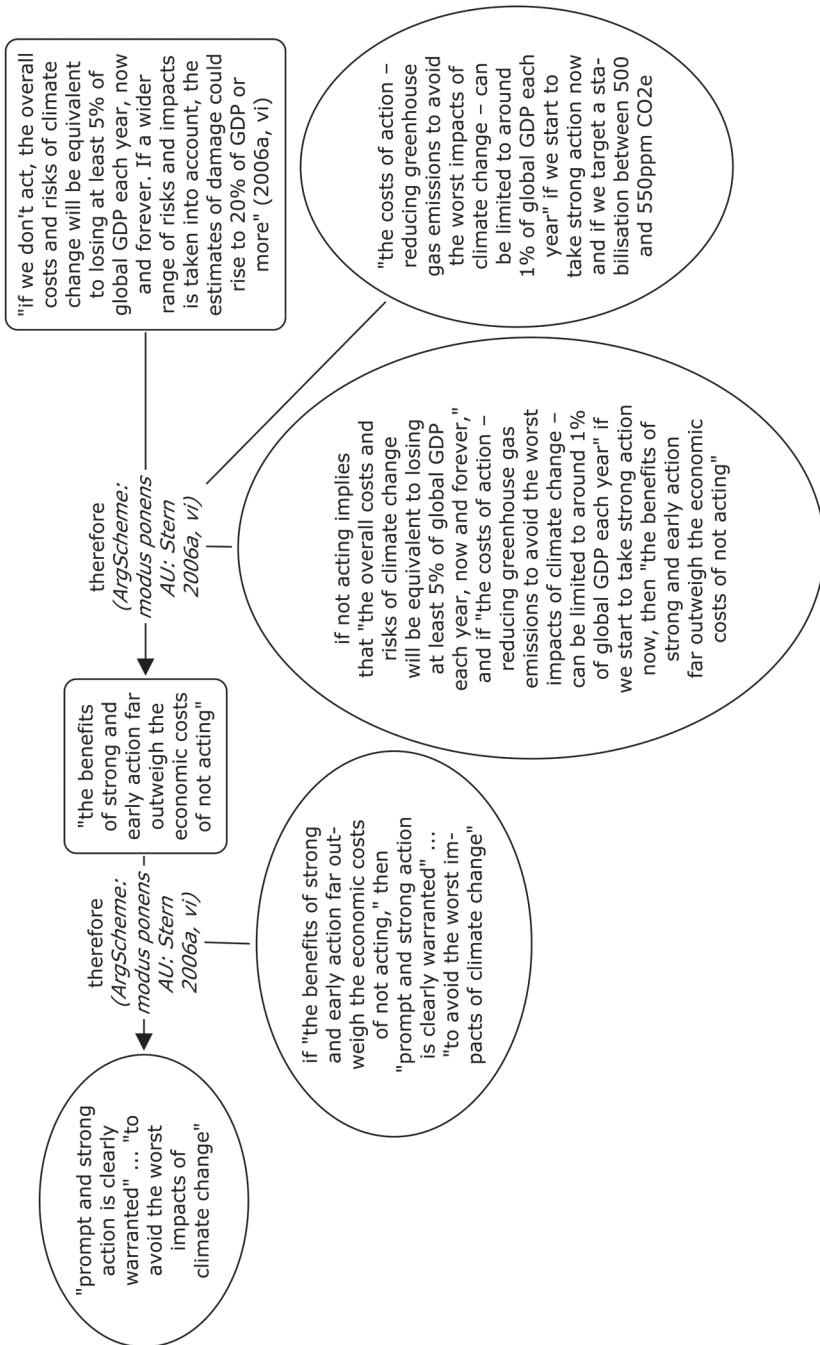


FIGURE 3. The main argument of the Stern Review, with its final conclusion on the left.

objections, comments, or suggestions; everything has its place and is connected to something that is already given.

As an example of the kind of deliberation that can be represented in LAM, let us have a look at a series of objections that have been formulated by Clive Spash and Paul Baer against the first enabler of the review's main argument (Baer and Spash 2010; Spash 2007; see Figure 4). These counterarguments attack the core of Stern's argumentation by questioning whether a cost-benefit analysis can be a "suitable tool" for generating climate policies. This question concerns the first basic *ethical dimension* of this debate because the review's cost-benefit analysis obviously presents a utilitarian argumentation that can be criticized as inadequate.

The main points regarding this ethical dimension are the reference to "human lives and environmental quality" in the middle of Figure 4 and to "catastrophic surprises" at the bottom. Both points can be clarified and supported by the consideration that "risks of catastrophic species losses of 25 per cent or even 50 per cent or more would only enter the decision calculus [in the Stern Review's utilitarian approach] inasmuch as one could put a monetary value on them" (Baer and Spash 2010, 177). Moreover, as Spash elaborates,

There is potential for large surprises. The surprises are not some bounded probability distributions which experts can specify by staring into their crystal balls and magically convert from vision to monetary value (absolute or GDP). The surprises are potential scenarios which scientists can outline to the best of their ability and which involve loss of life and human infrastructure on a grand scale; losses only preceded by the mass movement of people, death and destruction of World War II. However, there is no enemy to defeat nor peace treaty to sign, only our own actions to control. Once the surprises start in earnest, action will be too little too late. For example, ice sheet melt causing a six meter sea level rise is a scenario which would flood all the major coastal cities. A two-meter sea level rise alone will displace hundreds of millions of people and inundate low lying cities. . . . How does this get transformed into X% GDP with any semblance of meaning left in the utter disaster and human suffering which would be entailed? (2007, 711)

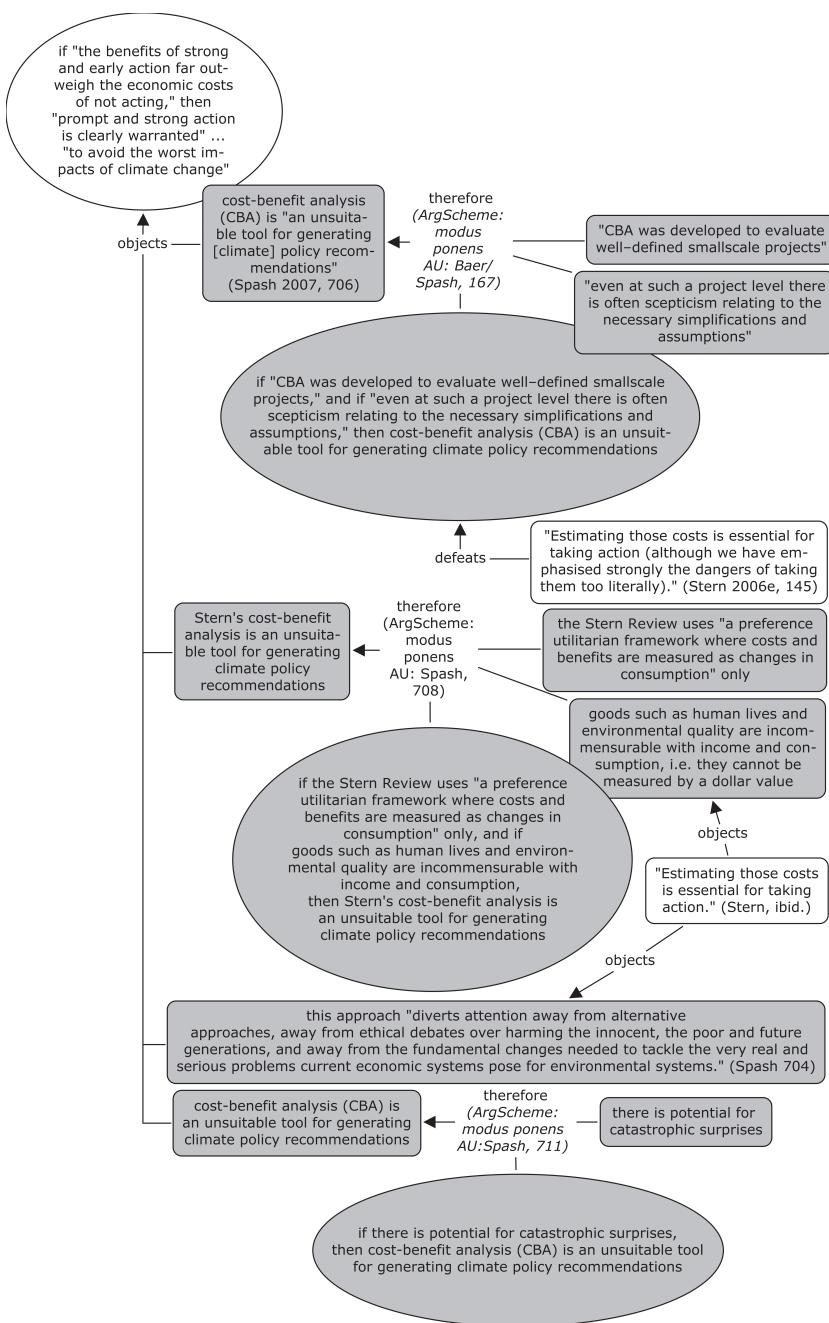


FIGURE 4. A series of "critical questions" against the enabler of the main argument in Figure 3, on the left.

However, I think that the authors of the Stern Review can counter these objections against their utilitarian stance by stressing that, as I quote in Figure 4, “estimating those costs is essential for taking action” (Stern 2006e, 145). Even though the development of the global climate can get so bad that a utilitarian argumentation can no longer be justified, it nevertheless makes sense to calculate costs and benefits within a limited framework of more or less idealized conditions. The authors of the Stern Review acknowledge these limitations throughout. Worst-case scenarios do not diminish the value of methods that are generally assumed to be basic for reasonable policy making, even though they point to their limits.

Further ethical questions are involved in the debate about the costs of avoiding climate damages. This part of the debate is connected to the second reason in the Stern Review’s main argument, which is located at the bottom of the right side of Figure 3. This second reason assumes that “the worst impacts of climate change can be limited to around 1% of global GDP each year” if we start to take strong action now and if we target a stabilization level between 500 and 550 parts per million (ppm) carbon dioxide-equivalent (CO_2e) emissions.¹⁶ Figure 5 presents Stern’s argument for this assumption (please note that the second reason in Figure 3 is now the conclusion of a supporting argument).

Although this part of the debate seems to be only about the “value-neutral” question of how much it would cost to stabilize emissions at different levels, the objection on the right of Figure 5 indicates that there is nevertheless a serious ethical problem involved: The term *cost* can mean very different things for poor and for rich countries. A similar problem should be addressed with regard to an objection that has been formulated by Robert Mendelsohn (2008) against the numbers of the Stern Review. Whereas Spash and Baer criticize a target between 500 and 550 ppm CO_2e emissions as too high since it “means effectively accepting global average temperature increases above 2°C” (Baer and Spash 2010, 168), Mendelsohn argues—as shown in Figure 6—that a higher level would be much more cost-efficient. Instead of “an aggressive near-term policy,” he writes, “it would be preferable to begin instead with a moderate and universal abatement program that would gradually tighten emissions over time. This moderate dynamic approach would lead to lower total costs (abatement costs and climate damages) than either” doing nothing or targeting 500 to 550 ppm CO_2e immediately (2008, 46; cf. also Nordhaus 2007).

One of the most controversial decisions made by the authors of the Stern Review was to model the overall costs of doing nothing against climate change (called “business as usual”) based on a discount rate of 1.4 percent,

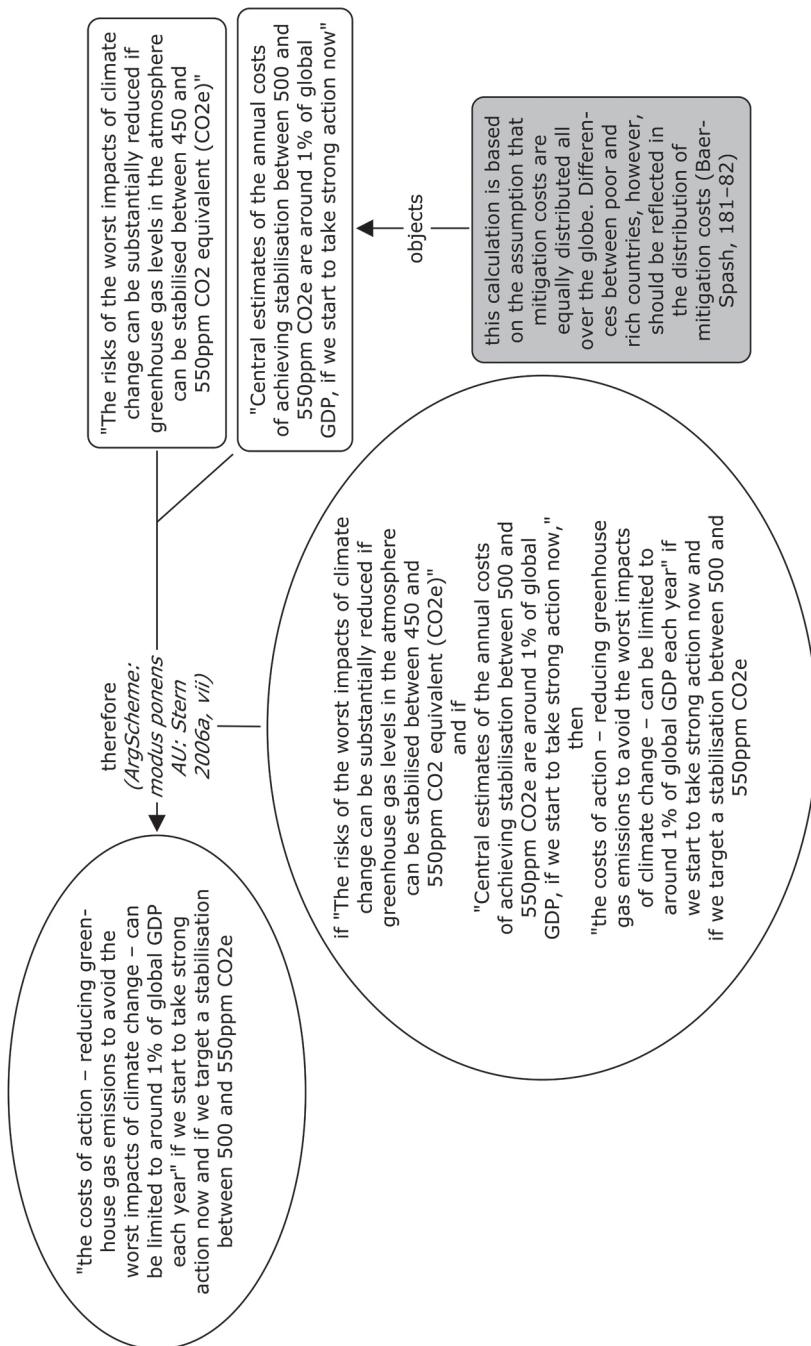


FIGURE 5: Stern's "cost of action" argument. Besides the "global justice" objection on the right, another controversy revolved around the enabler in the middle; see Figure 6.

which itself was based on a discount rate of pure time preference of only 0.1 percent. The practice of discounting is standard practice in policy making because we need to take into account, for calculating costs in the future, that future generations will probably be richer than we are today (based on extrapolation from the past). But part of the discount rate is not only the expected growth rate of per capita consumption but also what is called “the rate of pure time preference.” The discount rate of pure time preference, as Nordhaus writes, “refers to the discount in future

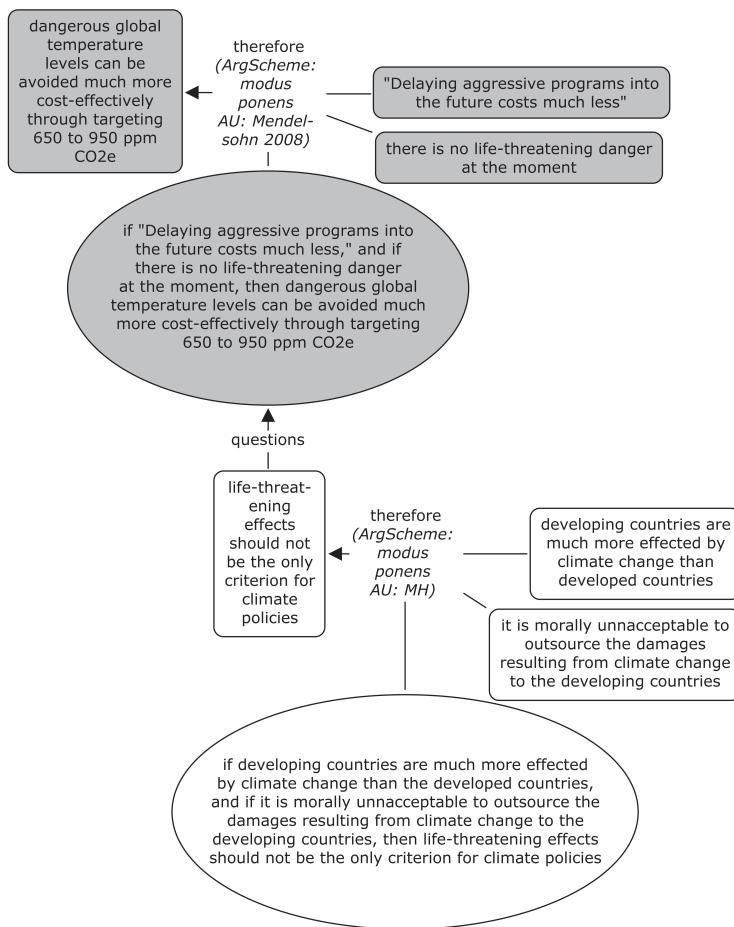


FIGURE 6. A counterargument against Mendelsohn’s counterargument that defeats the enabler in the argument of the Stern Review that is depicted in Figure 5.

welfare, not future goods or dollars. A zero time discount rate means that future generations into the indefinite future are treated symmetrically with present generations; a positive time discount rate means that the welfare of future generations is reduced or ‘discounted’ compared to nearer generations” (2007, 690).

The Stern Review justifies the low discount rate of pure time preference by an important ethical principle: “The welfare of future generations should be treated on a par with our own” (Stern 2006d, 5). It is, the authors write, of course “possible that people actually do place less value on the welfare of future generations, simply on the grounds that they are more distant in time. But it is hard to see any ethical justification for this” (Stern 2006b, 31). While this argument would imply that the discount rate of pure time preference should be zero, the authors’ decision to use 0.1 percent results from the possibility of extinction by other causes like a meteorite hitting the Earth: “The only sound ethical basis for placing less value on the utility (as opposed to consumption) of future generations was the uncertainty over whether or not the world will exist, or whether those generations will all be present” (Stern 2006c, 45).

Nordhaus criticized this ethical argument of the review by the two arguments that are represented in Figure 7. Both these counterarguments, however, can be rejected, I think. My counter-counterargument against Nordhaus’s second reason is represented in Figure 7 at the bottom; his first reason is indeed acceptable since it is correct that the review does not compare its ethical approach with alternatives. However, as shown in Figure 8, I do not think that any of the alternatives that Nordhaus discusses in this context are more convincing.

The last argumentation that I want to discuss is highly significant for the emerging “climate ethics” because it claims, at one point, a “right to climate protection or climate security of future generations” (Stern 2006c, 42). In the context of the Stern Review, this argumentation is interesting because there is obviously a serious tension between this deontological claim and the overall utilitarian approach of the review. Within the review, this debate is located in an appendix to section 3 in chapter 2, which itself is titled “Ethics, Welfare, and Economic Policy.” In this section, the authors write: “It is important to consider a broader range of ethical arguments and frameworks than is standard in economics, both because there are many ways of looking at the ethics of policy towards climate change, and, also, because in so doing we can learn something about how to apply the more

standard economic approach" (Stern 2006b, 28). So far, so good. However, things are getting a bit confusing in the following discussion:

The ethical framework of standard welfare economics looks first only at the consequences of actions (an approach often described as "consequentialism") and then assesses consequences in terms of impacts on "utility" (an approach often described as "welfarism,"

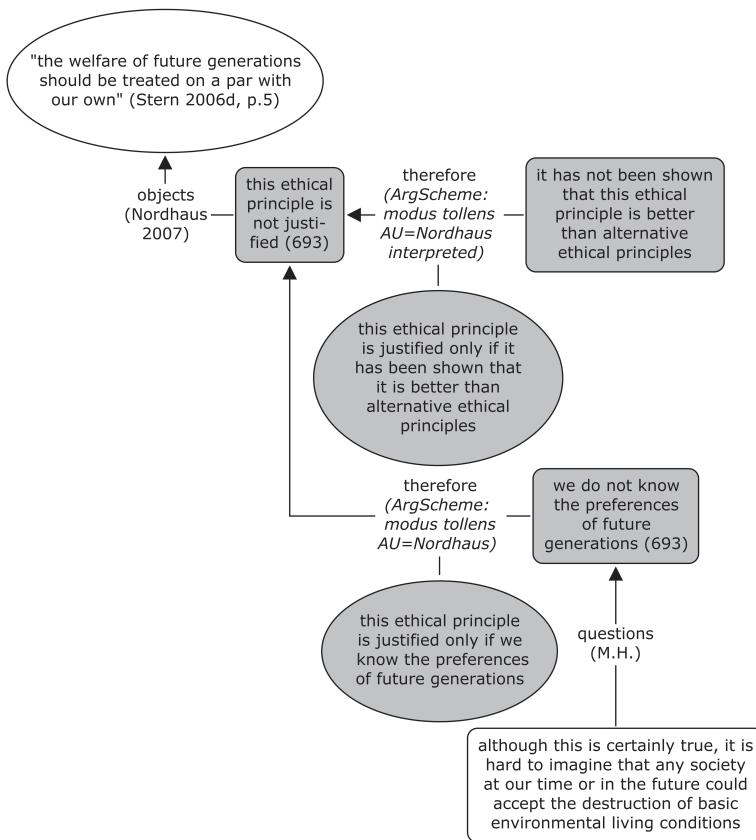


FIGURE 7. Nordhaus's two counterarguments against the Stern Review's ethical principle that is depicted on top. Explaining the significance of his reason at the bottom, Nordhaus writes: It is possible that in the future "large parts of the population lose interest in economic goods and turn to ascetic pursuits, or where rich nations use higher productivity to develop fiendish new weapons, or where people come to love the altered landscape of the warmer world" (2007, 693).

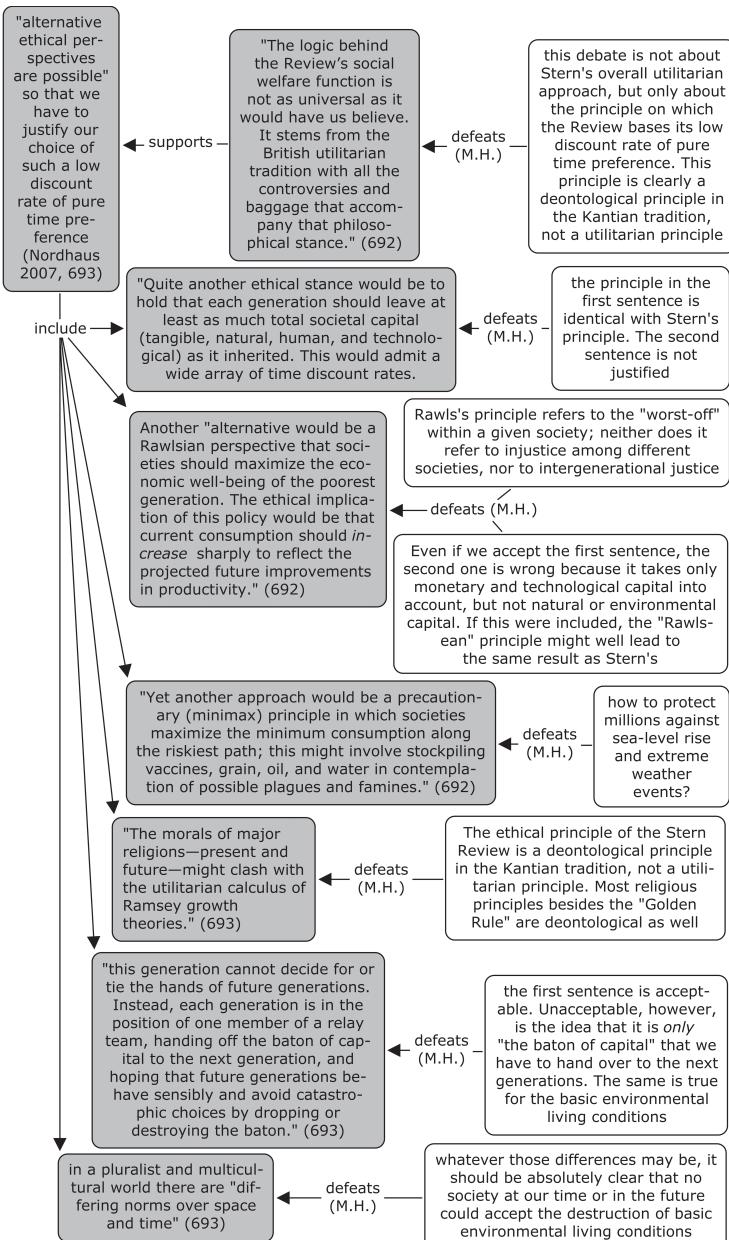


FIGURE 8. Nordhaus presents a list of “alternative ethical principles” that he thinks are superior to Stern’s principle that we should treat “the welfare of future generations on a par with our own.”

as in Sen (1999), Chapter 3 and the appendix to this chapter). This standard welfare-economic approach has no room, for example, for ethical dimensions concerning the processes by which outcomes are reached. Some different notions of ethics, including those based on concepts of rights, justice and freedoms, do consider process. Others, such as sustainability, and stewardship, emphasise particular aspects of the consequences of decisions for others and for the future, as explained in the technical appendix. (Stern 2006b, 29)

Directly after this quote we read the following (the first paragraph is highlighted in the review):

Nevertheless, the consequences on which most of these notions would focus for each generation often have strong similarities: above all, with respect to the attention they pay to consumption, education, health and the environment.

And all the perspectives would take into account the distribution of outcomes within and across generations, together with the risks involved in different actions, now and over time. Hence the Review focuses on the implications of action or inaction on climate change for these four dimensions. (Stern 2006b, 29)

So, it looks as if the only function of discussing a variety of ethical approaches is to demonstrate that the effects of climate change and the justification of climate policies should be discussed with regard to the four dimensions “consumption, education, health and the environment,” thus overcoming the narrow focus on consumption that only characterizes traditional welfare economics. This marginalization of alternatives to utilitarianism is confirmed by the way the authors deal with the main *problem* of climate ethics:

The incremental impact of a tonne of GHG [greenhouse gas] is independent of where in the world it is emitted. But the volume of GHGs emitted globally is not uniform. Historically, rich countries have produced the majority of GHG emissions. Though all countries are affected by climate change, they are affected in different ways and to different extents. Developing countries will be particularly badly hit, for three reasons: their geography; their stronger dependence on

agriculture; and because with their fewer resources comes greater vulnerability. There is therefore a double inequity in climate change: the rich countries have special responsibility for where the world is now, and thus for the consequences which flow from this difficult starting point, whereas poor countries will be particularly badly hit. (Stern 2006b, 29)

The solution they provide for this problem, however, is clearly utilitarian, albeit somewhat more sophisticated than what we would find in standard welfare economics (the first paragraph is again highlighted):

There are particular challenges in valuing social welfare across countries at different stages of development and across different income or consumption levels.

The ethical question of how consequences for people in very different circumstances should be aggregated must be faced directly. For the sake of simplicity and clarity, we shall adopt the perspective of the “social welfare function” approach. (Stern 2006b, 30)

The “social welfare function” approach they propose allows them “to ‘[add] up’ the wellbeing of different people,” focusing on the well-known utilitarian objective of a “maximisation of the sum across individuals of social utilities of consumption.” Although the authors acknowledge that this utilitarian approach “is not always consistent with ethical perspectives based on rights and freedoms,” they praise its “virtue of clarity and simplicity, making it easy to test the sensitivity of the policy choice that emerges to the value judgements made” (Stern 2006b, 30).

The considerations in the appendix are structured in a similar way, even though they start with a much stronger emphasis on deontological foundations of climate ethics: “Future generations should have a right to a standard of living no lower than the current one” (Stern 2006c, 42). The discussion, however, is again complicated, and its outcome is not really clear. Let me quote almost the entire passage in which this discussion takes place. After that, I want to show how Logical Argument Mapping can be used not to “represent” the arguments in the quote but to *reconstruct* them in a way that goes well beyond what is provided in the text. My goal is to show how the discussion can thus be clarified and its limits and possibilities analyzed. In the following quote the numbers counting the paragraphs are mine; I use them for

references in the maps (paragraphs 1, 8, and 12 are highlighted in the Stern Review):

(1) Impacts of climate change on future generations and other nations raise very firmly questions of rights. Protection from harm done by others lies at the heart of many philosophical approaches to liberty, freedom and justice.

(2) Protection from harm is also expressed in many legal structures round the world in terms of legal responsibility for damage to the property or well-being of others. This is often applied whether or not the individual or firm was knowingly doing harm. A clear example is asbestos, whose use was not prohibited when it was placed in buildings with the worthy purpose of protecting against the spread of fire. Nevertheless insurance companies are still today paying large sums as compensation for its consequences.

(3) This is a version of the “polluter pays” principle that is derived from notions of rights, although, as we saw, for example, in the discussion of Fig. 2.1 above, it also arises from an efficiency perspective within the standard economic framework. If this interpretation of rights were applied to climate change, it would place at least a moral, if not a legal, responsibility on those groups or nations whose past consumption has led to climate change.

(4) Looking at the moral responsibilities of this generation, many would argue that future generations have the right to enjoy a world whose climate has not been transformed in a way that makes human life much more difficult; or that current generations across the world have the right to be protected from environmental damage inflicted by the consumption and production patterns of others.

(5) The notions of the right to climate protection or climate security of future generations and of shared responsibilities in a common world can be combined to assert that, collectively, we have the right only to emit some very small amount of GHGs, equal for all, and that no-one has the right to emit beyond that level without incurring the duty to compensate. We are therefore obliged to pay for the right to emit above that common level. This can be seen as one argument in favour of the “contract and converge” proposition . . . , whereby “large emitters” should contract emissions and all individuals in the world should either converge to a common (low) level or pay for the excess (and those below that level could sell rights).

(6) There are problems with this approach, however. One is that this right, whilst it might seem natural to some, is essentially asserted. It is not clear why a common humanity in a shared world automatically implies that there are equal rights to emit GHGs (however low). Equality of rights, for example to basic education and health, or to common treatment in voting, can be related to notions of capabilities, empowerment, or the ability to participate in a society.

(7) Further, they have very powerful consequences in terms of law, policy and structures of society. How does the “right to emit” stand in relation to these rights? Rights are of great importance in ethics but they should be argued rather than merely asserted. More pragmatically, as we shall examine in Part VI of this report, action on climate change requires international agreement and this is not a proposition likely to gain the approval necessary for it to be widely adopted.

(8) A concept related to the idea of the rights of future generations is that of sustainable development: future generations should have a right to a standard of living no lower than the current one. . . .

(12) The notion of “stewardship” can be seen as a special form of sustainability. . . .

(14) These different notions of ethics emphasise different aspects of the consequences of decisions for others and for the future. Nevertheless, the list of consequences on which they would focus for each generation are similar: above all consumption, education, health and environment.

(15) And all the perspectives would take into account the distribution of outcomes within and across generations, together with the risks involved in different actions, now and over time. Hence in the Review we shall focus our analysis on the implications of action or inaction on climate change for these four dimensions.

(16) How the implications on these four dimensions are assessed, will, of course, vary according to the ethical position adopted. How and whether, in making assessments, we attempt to aggregate over consequences (i) within generations, (ii) over time, and (iii) according to risk will be crucial to policy design and choice. When we do aggregate explicitly we have to be quantitative in comparing consequences of different kinds and for different people. We shall be paying special attention to all three forms of aggregation. Aggregation across dimensions poses different kinds of questions and problems, as was discussed in Section 2.3 above. (Stern 2006c, 41–43)

As we can see, this long discussion results again in a somewhat confusing combination of a deontological approach that is based on rights and a utilitarian one that is based on aggregating costs and benefits. The authors seem to assume that this combination of approaches is acceptable as long as both converge at the four dimensions already mentioned (consumption, education, health, and environment). But what does “convergence” mean here? The authors of the Stern Review merely claim that different ethical approaches “would focus” on the same four dimensions (para. 15). Although they acknowledge that the assessment of how to deal with these four dimensions “will, of course, vary according to the ethical position adopted” (para. 16), they do not realize that these are really conflicting ethical approaches that will inevitably lead to conflicting recommendations for climate policies. To see this point, let us first reconstruct, in somewhat idealized fashion, the arguments that the Stern Review develops in the paragraphs 1 to 7 quoted above.

Figure 9 represents the strong deontological argument whose conclusion is formulated at the end of paragraph 3 and the main reason in paragraph 1. In paragraph 2 the authors mention that the reason—the right to protection from harm—is expressed “in many legal structures round the world.” Indeed, we could use the Universal Declaration of Human Rights (U.N. Office of the High Commissioner for Human Rights 1948) to justify the main reason on the right of Figure 9 by a further argument (see Figure 10).

It should be noted that the final conclusion of the argument in Figure 9, which claims the “responsibility” of polluters, is not as strong as the “polluter pays” principle that I am using as the reason for this conclusion. Applying this principle would imply, for example, that there is a legal obligation for the developed nations to pay for the billions of damages that were caused by the recent catastrophic floods in Pakistan and elsewhere if it could be proved that these extreme weather events were causally related to global climate change. Such an obligation that can be derived, in a deontological argumentation, from basic human rights like the ones mentioned in Figure 10 would go well beyond the utilitarian calculation provided by the Stern Review, because this utilitarian argument focuses only on the reduction of greenhouse gases to prevent costs in the future.

What is odd in the long passage quoted above is that the strength and clarity of the deontological argumentation represented in Figures 9 and 10 are somewhat countered by an argumentation that diverts the reader’s attention to something completely different. As depicted in Figure 11, the review develops an argument in which the “right to climate protection or

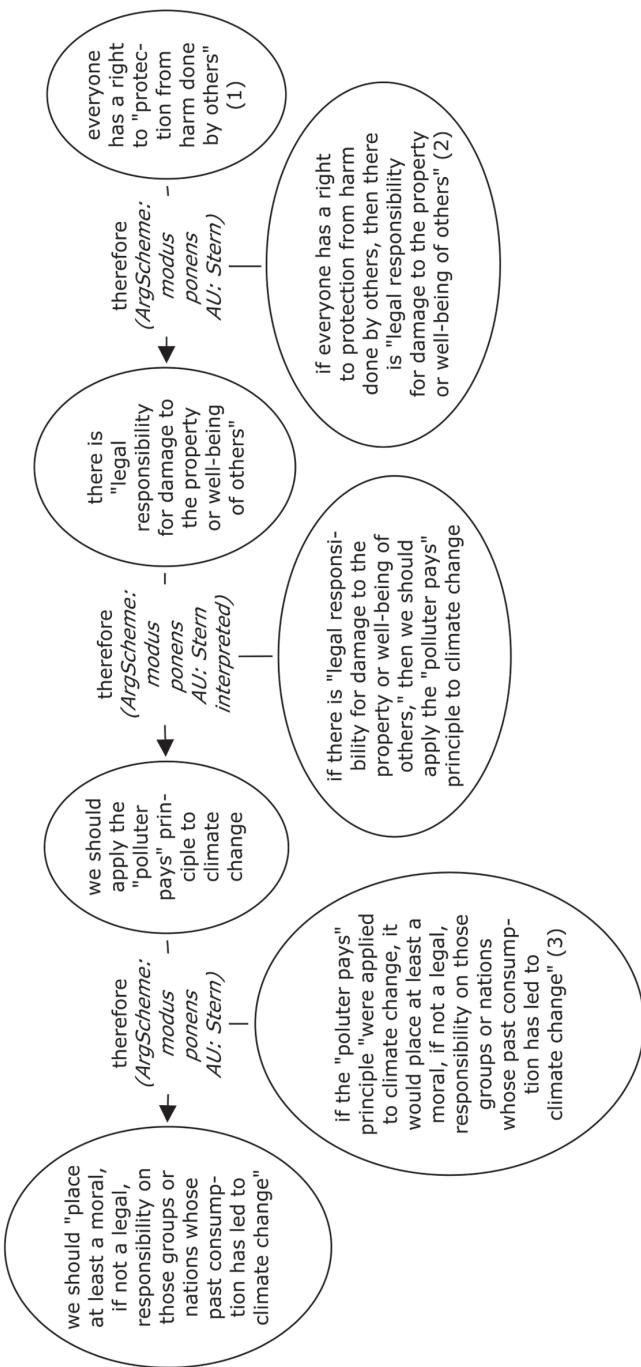


FIGURE 9. Deriving the “polluter pays” principle from a right to protection from harm done by others.

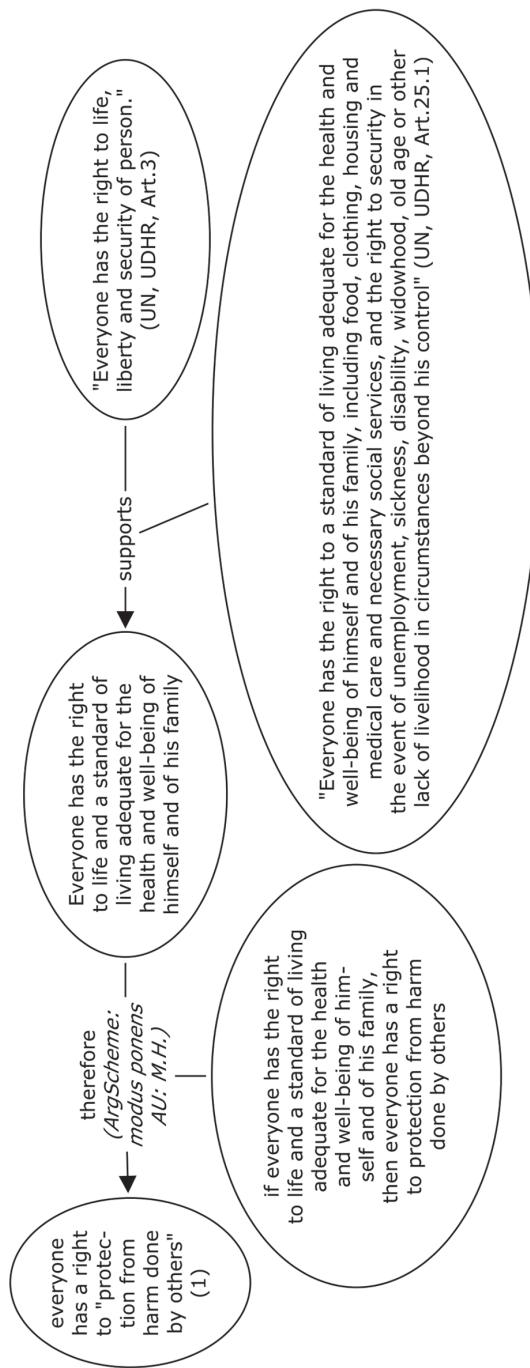


FIGURE 10. Justifying the reason of Figure 9 by the Universal Declaration of Human Rights.

climate security" is used as a reason to justify a "right" to emit greenhouse gases, even though only "some very small amount" (para. 5). Against this argument, however, the authors themselves develop three counterarguments that could indeed be strengthened by the "defeat" relation that I present in Figure 11 on the bottom. However, the crucial point is that these counterarguments are completely irrelevant when it comes to the deontological argument that is reconstructed in Figure 9. All this looks as if the main intention here was to distract the reader from the clear conclusion

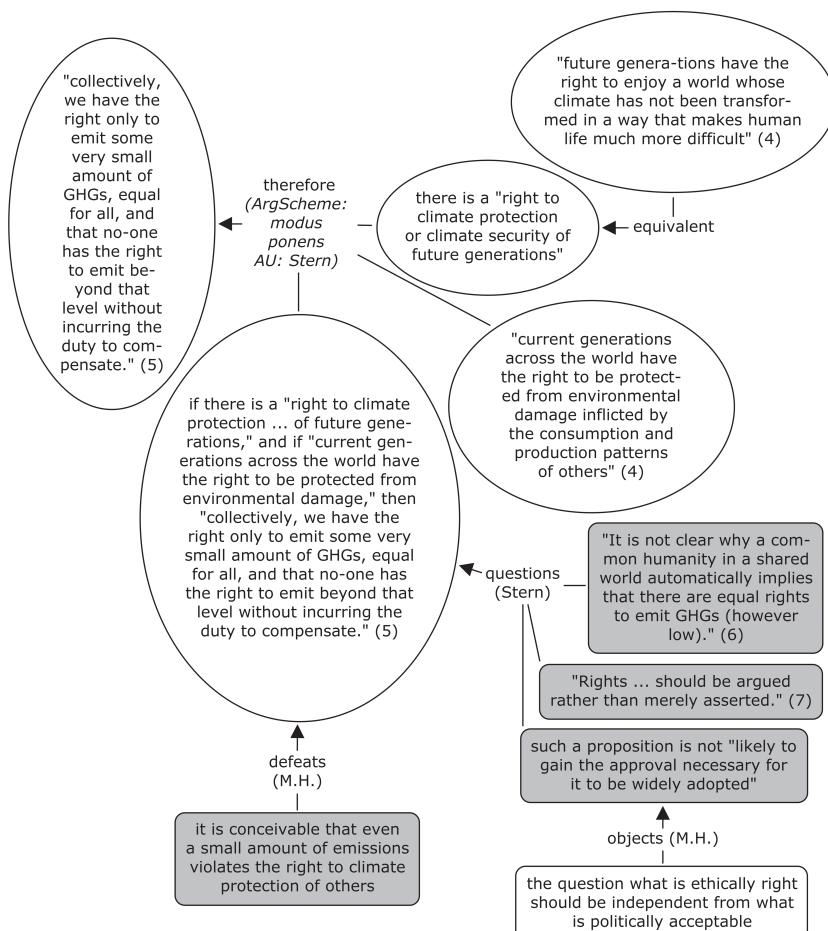


FIGURE 11. Can a "right to pollute" be derived from a "right to climate protection"?

that has been reached before. Moreover, the debate that is depicted in Figure 11 could easily be resolved by reformulating the conclusion: we have a right to emit only so much greenhouse gas as does not violate the right to climate protection of others.

What can we learn from this analysis, which shows—facilitated by the LAM maps depicted in Figures 9 and 11—that the ostensible difficulties with the deontological argument discussed in Figure 11 in no way diminish the strength of the deontological arguments represented in Figures 9 and 10? What we can learn is that there is no way to avoid the conflict between a deontological argumentation that is based on the assumption of an inviolable right to “protection from harm” (para. 1) and a utilitarian argumentation that aggregates “consequences of different kinds and for different people” (para. 16). Whereas the deontological argument leads to the “polluter pays” principle, the utilitarian argument would allow harm to future generations and other people at least so far as the overall cost-benefit balance is tipped in favor of the benefits.

One might argue, however, that the conflict between a deontological and a utilitarian approach can be avoided when the former is only used to justify a certain detail in an overall utilitarian argument. I applied this strategy implicitly in the Web representation of the complete debate by relating the deontological argument only to the discussion about the discount rate of pure time preference that I mentioned above. The Stern Review seems to follow the same strategy, because it seems to use the deontological argument only in the discussion of this discount rate (Stern 2006c, 48).

Such a strategy, however, would threaten the consistency of the overall argumentation. Using “the right to climate protection or climate security” (para. 5) only to validate that “the welfare of future generations should be treated on a par with our own” in a calculation of future costs and benefits (Stern 2006d, 5), but not for general protection and the obligation to compensate, can hardly be justified.

Conclusion

Looking at the details of the debate about the Stern Review we realize immediately—as philosophers—that this is for the most part a highly technical debate whose understanding requires a good deal of expertise in economics and the modeling techniques used. At the same time, however, it is

obvious that there is a demand for more professional ethical analyses. This has been highlighted in my discussion particularly with regard to the question of whether climate policies should be based on a utilitarian or a deontological approach. Ethical reflection should be *integrated* “into the work of other institutions engaged in climate change policy,” as the Program on the Ethical Dimensions of Climate Change formulates in its white paper (Brown et al. n.d., 3).

Collaboration with other disciplines and the public, however, confronts us with the problem of how high-quality deliberation among a large number of participants might be possible. It is just this problem for which the approach I am presenting here might be useful. Logical Argument Mapping can be a tool that helps us to structure and manage complexity in large-scale deliberation. Its main procedural contribution in facilitating deliberation results from the fact that the logical validity of arguments provides an easily comprehensible and usable standard of completeness. We know what a deductive argument like modus ponens has to look like, and in software tools these arguments can be automatically generated based on user input. Reflection on logically complete arguments shows us immediately where the gaps in our reasoning are. Even though we might start with the thesis that a certain reason is sufficient to produce a claim, looking at the enabler that represents the inferential relation in a deductively complete argument will often lead to the insight that we need to break down our reasoning into more steps than originally assumed, or that we need additional reasons, or that we need further support for our premises, or that we should reformulate or give up the entire argument. The fact that it is possible to represent a huge debate like the one on the economics of climate change in one, big argument map in which every position and counterposition can be exactly located proves that Logical Argument Mapping can be a tool for what Dewey called “*the* problem of the public”: to improve “methods and conditions of debate, discussion, and persuasion.”

NOTES

1. See <http://www.whitehouse.gov/administration/eop/ope/about>.
2. See http://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment/.
3. Ibid.
4. Smith distinguishes two broad approaches to deliberative democracy according to how they define the legitimacy of decision making: Whereas in

“proceduralist models” outcomes “are legitimate so long as they are obtained via a fair process,” they are legitimate in “epistemic models . . . so long as they either meet certain procedure-independent epistemic standards or . . . are the result of democratic procedures that are themselves of epistemic value” (2007, 27ini).

5. See http://www.americanprogress.org/issues/2009/06/pdf/web2_o_memo.pdf.

6. See <http://lam.spp.gatech.edu/> and <http://agora.gatech.edu/>. A preliminary prototype of the AGORA system is accessible via a link from this page. The software development is supported by a grant from the U.S. Department of Education (grant P116S100006).

7. The most comprehensive overview so far is available in the collection of “essential readings” edited by Gardiner et al. (2010). See also Brown et al. n.d.

8. Published as a book (Stern 2007) and at http://www.hm-treasury.gov.uk/stern_review_report.htm. For an overview of the debate, see Godard 2008.

9. For a comprehensive overview and discussion, see Scheuer et al. 2010. Online tools are, for example, <http://www.argunet.org/debates/>, <http://olnet.org/>, <http://cohere.open.ac.uk/>, <http://www.climatecollaboratorium.org/>, <http://www.convinceme.net/>, <http://www.createdebate.com/>, <http://debategraph.org/>, <http://debatepedia.idebate.org/>, <http://debatewise.org/>, <http://athenabridge.wordpress.com/>, <http://glossem.wordpress.com/>, <http://pep-net.eu/>, and <http://www.procon.org/> (all accessed May 19, 2010).

This is not the place to provide a full justification of LAM’s design in comparison with other approaches; for that, see http://agora.gatech.edu/?page_id=99, in addition to Hoffmann 2005, 2007, 2008, forthcoming.

10. That is the one I am discussing here. See also <http://tinyurl.com/2209q9q> for a map of Thomas Nagel’s article “The Problem of Global Justice” and <http://tinyurl.com/65c2os> on “geo-engineering” the Earth’s climate.

11. You might try different Internet browsers. Since the maps are basically large image files, Microsoft’s Internet Explorer tends to present LAM maps in poor quality in order to reduce the loading time. Mozilla Firefox and Opera generally work better. In order to get an overview of the entire map, zoom out. PDF versions of all my maps can be downloaded from http://works.bepress.com/michael_hoffmann/. These are easier to navigate with Adobe Acrobat’s “hand” tool.

12. All maps were created with the freely available IHMC CmapTools: <http://cmap.ihmc.us/>.

13. See <http://lam.spp.gatech.edu/>. This manual also describes the mapping procedure and “objection schemes” to represent different forms of objections.

14. In previous publications I called the enabler “inference rules,” but this term is sometimes used in the literature in the sense of “argument scheme.”

15. I am grateful for the critical reading and the comments my colleague Paul Baer provided regarding an earlier version of the map. But it should be clear that

any observer frames things from a certain limited perspective; see Hoffmann forthcoming.

16. Climate scientists transform the effects of other climate-relevant emissions like methane into equivalent values of CO₂.

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