

GLOBAL DEVELOPMENT AND ENVIRONMENT INSTITUTE

WORKING PAPER NO. 11-02

**Ethics and the Economist: What Climate Change
Demands of Us**

J. A. Nelson

May 2011

Tufts University
Medford MA 02155, USA
<http://ase.tufts.edu/gdae>

This working paper is also available as an E3 (Economists for Equity and the Environment, e3network.org/) White Paper. A revised version will be published in *Ecological Economics*.

©Copyright 2011 Global Development and Environment Institute, Tufts University

Abstract:

Climate change is changing not only our physical world, but also our intellectual, social, and moral worlds. We are realizing that our situation is profoundly *unsafe*, *interdependent*, and *uncertain*. What, then, does climate change demand of us, as human beings and as economists? A discipline of economics based on Enlightenment notions of mechanism and disembodied rationality is not suited to present problems. This essay suggests three major requirements: first, that we take action; second, that we work together; and third, that we focus on avoiding the worst, rather than obtaining the optimal. The essay concludes with suggestions of specific steps that economists can take as researchers, teachers, and in our other roles.

Keywords:

climate change; ethics; catastrophe; uncertainty; interdependence; Enlightenment; responsibility; embodied reason

Ethics and the Economist: What Climate Change Demands of Us

J. A. Nelson

Climate change is changing our world. Not only is it changing our physical world, but also our intellectual, social, and moral worlds, in ways that we could not have imagined a generation or two ago. The science of climate change, and the political impasses associated with dealing with it, demonstrate that we are in a profoundly *unsafe*, *interdependent*, and *uncertain* world. We are already experiencing levels of greenhouse gases, the likes of which have not been seen on earth for at least 800,000 years (Weitzman 2011, 3). We are facing a need for globally coordinated action that humans, having evolved in smaller groups of kin and nation, have never before attempted. We are—contrary to our usual processes of learning or transformation—facing a problem of having to act in advance, instead of after, actually experiencing the consequence of our actions (Stern 2011, 2). We are, if we are honest about it, facing the possibility that all the skills and knowledge we've gained through our physical and social evolution and scientific investigations to date may not be adequate, or of the right kind, to save the human race (and the rest of the life on the planet) from catastrophic, dislocating changes.

While having these facts right in front of us does not necessarily mean that we all see them—denial being one habitual human response to difficulties—this essay leaves the task of describing and defending climate science to others. Likewise, many cogent critiques of the application of standard economic benefit-cost approaches to climate change, and many convincing arguments about the impossibility of ignoring the ethical

dimensions of climate change economics, have already been written.¹ Rather than repeat these arguments, this essay attempts to be primarily forward-looking and practical. What does climate change demand of economists? Given that we need to grapple with ethical issues, how can we best do so? Given that we do research and/or teach, how should what we now know—and, perhaps even more importantly, what we now know that we do *not* know—affect our practices in these areas?

1. Enlightenment: Beyond the Beta Version

Nicholas Stern has said that we need a "new industrial revolution" to address climate change (Stern 2011, 6). He also suggests that economists must consult other fields—including "science, technology, philosophy, economic history, [and] international relations"—as we develop our economic analysis (Stern 2011, 19). An even more basic revolution is, however, needed as well: An overhaul of the ideas of the Enlightenment, Beta Version, of the 18th century. This first version got off the drawing-boards of philosophers and has put to use in scientific, economic, and political practices worldwide. But it seems that a great many of the assumptions underlying Enlightenment Beta and early scientific thought were wrong, or at best very incomplete. The continued advance of science has, in fact, undermined the earlier version—and with it, the economics based on it.

It has long been a central tenet of economic analysis, for example, that the best decision-making comes from having as much information as possible about the options at hand, and then—setting emotions aside—cooling performing a thoroughly rational (in the

¹ See, for example, DeCanio (2003), Howarth (2003), Dietz and Stern (2008), and Ackerman (2009).

sense of following rules of logic) comparison and ranking of various outcomes. More recent work on decision-making, in contrast, demonstrates that *less* information and deliberation can sometimes lead to *more* satisfactory outcomes. Faced with too many choices, too much information, and/or too much emphasis on weighing and comparing, psychologists have found, people may make worse choices on decisions from jams to houses (Iyengar and Lepper 2000; Dijksterhuis, Bos et al. 2006). Use of intuition, rules of thumb, and unconscious processes may lead, in some cases, to better outcomes with less regret (Gigerenzer 2007). Emotions have been found to be essential to rational (in the broad sense of reasonable and goal-serving) decision-making (Damasio 1994). A newer view of reason that is rapidly gaining ground (outside of economics) emphasizes the embodied nature of our consciousness. As put by George Lakoff and Mark Johnson,

Reason is not a transcendent feature of the universe or disembodied mind. Instead, it is shaped crucially by the peculiarities of our human bodies, by the remarkable details of the neural structure of our brains, and by the specifics of our everyday functioning in the world...Reason is evolutionary...Reason is not completely conscious, but mostly unconscious. Reason is not purely literal, but largely metaphorical and imaginative. Reason is not dispassionate, but emotionally engaged.

(Lakoff and Johnson 1999, 4)

Nor is reason something that is possessed by a lone organism in isolation: "The full understanding of mental phenomena should be sought in the context of an organism that is interacting with an environment" (Damasio 1997, 170).

To give an example relevant to the case at hand, suppose you are taking a walk in a forest at dusk. You suddenly see something long, thin, and curving before you on the path and instinctively jump back. On second glance, it turns out that this object is just a piece of discarded rope. Was it rational for you to have recoiled? Defining rationality in the narrow sense of referring to only logic and deliberation, it was not rational. Because a

piece of discarded rope is not dangerous, your recoil was not rationally justified by "the facts." Considering rationality in a broader and evolutionary sense, however, jumping backwards was a perfectly reasonable and, on average over such cases, likely survival-enhancing response. Instinctual recoil comes from a part of the brain that acts before the analytical processes have a chance to kick in. Had the rope been a snake, you could have been bitten while standing still waiting for your slower neural processes to inspect the object, weigh the evidence, and come to a decision. Holding out for the thoroughly informed and justified response is a sort of rationality that may be serviceable in simple, safe, and slow environments, but is not necessarily serviceable outside of them.

It has also long been believed that individuals' preferences are stable, and immediately accessible for use in our rational deliberations. Our social and physical environments, however, have been shown to affect how we act in ways that are quite inaccessible to our conscious mind. Psychological studies of framing effects show repeatedly that exposure to movies that are funny or sad, drinks that are cold or hot, or smells that are good or bad, as well as minor changes to the wording of questions, can change our expressed opinions, stated reasons, and decisions.² The conscious preferences thought to be sacrosanct in the rational choice view may in fact often not exist until they are externally, perhaps somewhat capriciously, and unconsciously created.

Individual freedom has long been taken as the *summum bonum* to be aimed for, especially in regards to economic systems. New science is pointing to our deep ties to one another, though processes such as mirror neurons which make us feel and repeat in our own bodies the motions we see others enacting (Iacoboni 2008). The point is not that

² See, as one examples of this now vast literature, Williams and Bargh (2008). Some of these phenomena have been incorporated into behavioral economics (Kahneman 2003).

individual freedom is unimportant, but that a monomaniacal focus on this "good" above all others leads to a serious neglect of—and even a blindness to—the interdependencies of family and community.

And, perhaps even more importantly, it has been assumed that the world we live in is such that it is amendable to cool, detached investigation and deliberation, and analytical models based on the mathematics of physics and engineering. In Enlightenment Beta the central image of the world was of a clockwork: Intricate but also thoroughly knowable, controllable, and mechanical. If the world was made by (Divine) Reason, and our species was uniquely (it was assumed) endowed with reason in order to know it and control it, then our technology and our philosophy makes us into demi-gods. But, as mentioned above, new generation science demonstrates that our human abilities of perception and cogitation are, in fact, evolved and embodied rather than being ethereally transmitted from a transcendent source. Even if we are convinced that there is a fundamental mathematical structure to the universe, new science suggests that a comparison of the complexity of this structure, vis a vis the limitations of our human wetware (brains), should be humbling. Epistemologically speaking, our knowledge is unavoidably limited and incomplete.

In Enlightenment Beta, the Divine Clockmaker set the world into ticking for our benefit. Such helpful world, under our dominion, would provide for us and be safe. It would wait while we make our investigations and thoughtfully consider our next, progress-making interventions, quite free from worry about our own survival or subsistence. Yet as early as the 1890s, and exactly in the center of the newly forming Neoclassical school of economics, such an image was already being questioned. Writing

in 1898 Alfred Marshall, the original great systematizer of Neoclassical economics, warned us about taking this image too seriously. Marshall recognized that Neoclassical economic models were based—not on revealed truth—but on metaphor: "There is a fairly close analogy between the *earlier stages* of economic reasoning and the devices of physical statics," he wrote, whereby by treating certain phenomena in isolation from each other can give some "exact and firm handling of a narrow issue" (Marshall 1898, 40). In particular, he noted, Western Europe was, at the time in which he was writing, in a unique window of time and space uniquely free of the "black shadow" (1898, 41) of ecological limits. Consistent with what had been historically experienced at his time, he conceived of these limits in terms of constraints imposed by agricultural fertility on population growth. Even with no knowledge of climate change, however, Marshall perceived that within some generations ecological limits would again become important, and that economics would need to go beyond the "early stage" of physics analogies and notions of stable equilibria, and develop "later stage" organic notions of permeating "mutual influence" (43) based on biological analogies of "life and decay" (43). Marshall also recognized, as just discussed above, our epistemological constraints: "Man's [sic] powers are limited: almost every one of nature's riddles is complex" (40). Unfortunately, however, Marshall's warnings that holding onto the physics metaphor beyond its usefulness would tend to "confuse and warp the judgment" (39), and that freedom from limits was only temporary, seem to have been thoroughly forgotten by most followers of the school he helped to found.

The physical sciences have long since moved beyond the Newtonian mechanics on which Neoclassical economics modeled itself. The new science of climate change

points out the (rather obviously, if we learn from the transition from our past to our present) fact that the future is unpredictable and that our well-being or even survival are not guaranteed. Climate change tells us that the world is not passive, submissive, willing to wait, and in existence simply for our benefit. Far from being a clockwork under our dominion, the climate system is, as one climate scientist has put it, "an angry beast and we are poking it with sticks."³

In Enlightenment Beta, the world was seen as supportive of the rational individual, predictable, and safe. The fields of physical science, philosophy, and economics that grew out of this mode of thought reflected these bedrock assumptions, employing a process in which bits of the world were analytically separated and explored. The goal was to find the universal rules and principles governing the world-mechanism. Great strides were made, particularly in areas in which this world view and the actual world have some resemblance. But new science points out that the world is also alive—and profoundly *unsafe, interdependent, and uncertain*. In the context of climate change, what does this demand of us? This essay suggests three central demands: first, that we *take action*; second, that we *work together*, and third, that we *avoid the worst cases*. But first, a few words are needed about some current views on ethics and economics that might seem to negate the need for any changes at all.

2. Ethics and Economics: Beyond the Split

To many economists, of course, discussion of ethics seems to be beside the point. Economic analysis is sometimes perceived of as value-free and objective, while ethical judgments are normative and subjective. Such views have been debunked at length by

³ Weitzman (2010), quoting climate scientist Wallace Broecker.

climate economists (e.g., Howarth 2003; Dietz and Stern 2008), as well as philosophers (e.g., Putnam 2003; Kitcher 2011), and a full analysis will not be attempted here. Suffice it to note that contemporary Neoclassical orthodoxy contains myriad value-judgments, that only appear as objective from within a culture of disciplinary group-think in which alternatives are simply not entertained. The unquestioned priority given to individual freedom of choice, for example, is clearly a value judgment, in that it ranks freedom above other possible—for example, more pro-social or pro-environment—values. The methodological valuing of the elegance, precision, and "artificial crispness" (Weitzman 2009, 18) of mathematical models of optimization involves a normative and subjective judgment that these qualities are of more worth than other methodological goals, such as richness or realism. And, of course, economists should recognize the issue of opportunity cost: Research is not done in a vacuum, and the very question of our salaries and research budgets is based on decisions that value some lines of research above others. If we are absorbed in rearranging deck chairs on the Titanic when we could have helped chart another course, we will bear some moral responsibility for the ship going down.

Alternatively, we as economists may realize the relevance of ethics, but consider it to be in the domain of the Philosophy Department. Paying more attention to ethics might seem to mean that we must become versed in deontology, consequentialism, virtue ethics, Kant, Rawls, Aristotle, and the like—or at least read those economists who try to translate such material into more familiar terms. Believing that such an investment is necessary before one can take an ethical stand, however, could be compared to believing that one must invest in economics graduate training before one can be allowed to make a purchase at the grocery store. Ethics is not something owned by the philosophy

department, but rather something we, inescapably, *do*—just as we also, by virtue of being human, participate in economic life.

In fact, by deflecting our attention from the world we actually live in to the artificial rarified worlds lived in by the "liberal man" of traditional analytical philosophy and the "economic man" of orthodox Neoclassical economics, some discussions of moral philosophy and economics can be actively harmful. For example, Oxford moral philosopher Jonathan Broome has penned, among other works, a background piece for the *Stern Review on Climate Change* (2006) and a high-profile article on climate ethics for *Scientific American* (2008). His background piece is thoroughly based on economic expected utility theory and the reductionist ethics of aggregating quantities and qualities of life dependent only on utilities from the consumption of goods (2008, 15). In his 2008 article, Broome's assertion that future generations will "be richer than we are" seems to be borrowed from economists who project GDP growing forever. Such an assertion, of course, is based on nothing more than unscientific extrapolation about the entire future based on the very recent (in human history) past, supplemented by extreme assumptions about the substitutability between natural and other forms of capital. Broome's "elementary moral principle" that "you should not do something for your own benefit if it harms another person" or at least "compensate" them for it if you do (2008, 97)--reflects the generally status-quo-preserving criterion of Pareto Efficiency enshrined in orthodox economics. While Broome uses his principle to argue that "the better-off among the current generation" should take the first steps towards climate change mitigation, this principle could also be interpreted to mean that if protection of the residents of Bangladesh from climate change harms United States living standards, then Bangladeshis

should pay compensation to residents of the United States.

Also taking his lead from economists, Broome insists that the ethical question be formulated in terms of a search for the "correct discount rate" and that philosophers concerned with the extinction of humanity must express the badness of this loss "in quantitative terms" (2008, 102, 100). While taken as a whole Broome's work comes down on the side of doing *something* about climate change, he suggests that detailed and quantitatively sophisticated work by ethicists and economists must precede democratic rational deliberation, which in turn much precede action on a societal scale. As in other studies of this ilk, the immediate prescription is not for action, but for further research. That would be a proper and reasonable view—were the world safe, rational, and certain. But what about the world that we live in?

3. We Must Take Action

What climate change demands of us, as economists, has extremely little to do with becoming well-versed in academic moral philosophy and everything to do with how we understand our situation as human beings facing a crisis of potentially immense magnitude.⁴ Recent studies of actual human moral *action*, in fact, suggests that the traditional focus of moral philosophy on principles and deliberation may be nearly beside the point. Principles may be based on reason, but action is based on *motivation*. The roles of emotions, imagination, narrative, socialization, and bodily actions are now being more strongly recognized.

⁴ Or, as put by a broader-thinking ethical philosopher: "Ethics is not about what detached, impersonal, objective, rational agents engaged in grand theorizing deduce. Rather, ethics is and should be about what imperfect human beings living in particular historical, socioeconomic contexts can and should do, given those contexts" (Warren 2000, 114).

Consider first the case of moral emotions. Most economists and analytical philosophers consider those to be unnecessary, or even distracting and detrimental, to moral judgment. In studies using brain imaging, observation of people with specific brain damage, and other techniques, however, psychologists have found that moral judgment is—initially at least, and often entirely—more a matter of affective moral response than of moral reasoning. Moral reasoning, rather than being part of the process of coming to a judgment, is more often—as a practical and empirical matter—involved in possible *post hoc* justifications of a judgment already arrived at intuitively.⁵ That is, we often sense the "rightness" or "wrongness" of something, and then may work to come up with reasons for what we feel (Greene, Sommerville et al. 2001; Haidt 2001; Greene and Haidt 2002). This is not to say that introspective moral reasoning plays *no* role—people may in some circumstances consciously reflect on their intuitive judgments, and then change their mind. While the willingness of an individual to rationally pore over and consider revising his or her moral views is admirable, in practice this seems to occur relatively rarely.

The word "*motivation*" has the same root as "*emotion*." For questions of positive moral *action*—as opposed to moral judgment—emotional responses such as empathy, sadness, and shame seem to be particularly important, while the role of moral reasoning is particularly weak. One can be an expert on the many ways of formulating principles of justice, but—as a number of commentators are now pointed out (Jonas 1984, 85; Warren 2000, 112; Haidt 2001)—if one does not have some emotional motivation—if one does

⁵ Or, perhaps, we arrive at the judgments opportunistically. One scholar of business ethics recounts the tale of an MBA graduate being asked about what he had learned in a traditional course on this topic: The graduate explained that he had "learned all about the models of ethical analysis...and that whenever he encountered a conflict, he could decide what he wanted to do and then select the model of ethical reasoning that would best support his choice" (Gentile 2010, xi).

not *care* about acting justly, for example—all the principles in the world will have no effect on behavior.

A motivating emotion of particular importance to the case of climate change, may be, as suggested by noted environmental ethicist Hans Jonas in his 1984 book *The Imperative of Responsibility*, that of fear. While much of Jonas' argument is phrased in the traditional styles of philosophical argument, he also points out that our development of technological powers with potentially profound and irreversible effects on the environment has created a world in which past and present experiences (Jonas 1984, 27) and the traditional ethics of rights and duties (Jonas 1984, 38) no longer serve as adequate guides. Linked to the point (to be argued at more length below) that what we need now is more attention to the avoidance of catastrophes than the achievement of best outcomes, he finds in fear a useful emotion for promoting action.

Notions of *moral imagination* and *narrative* are also central to the questions of ethical motivation. As Jonas put it, our "first duty" is to "visualize" the effects of our harmful environmental practices (27). "[T]he creatively imagined *malum*," he wrote, "has to take over the role of the experienced *malum*, and this imagination does not arise on its own but must be intentionally induced" (27). The by now *pro forma* introduction of articles on climate change with extensive reviews of specific, concrete dangers (e.g., sea level rise, methane clathrate releases, disruption of the thermohaline circulation, floods, droughts, storms, and so on—all expressed with vivid geographic specificity) can thus be seen as an essential and vitally important part of a responsible ethical practice. So, also, are narratives which (while they may seem wildly overoptimistic given current political

conditions) encourage people to have some hopefulness and a "can-do" attitude about addressing climate change. As long as there is life, there is hope.

Our actions are often also based on simple heuristics (Gigerenzer 2007) and good narratives (Lakoff 2004, Chapter 6; Taleb 2010), more than the logical weighing of alternatives. This suggests that, for inspiring action on climate change, detailed, rational, technocratic arguments—e.g., debates on the parameterization of climate and CBA models—may be less useful than economists generally prefer to think. While there is an important, *defensive* role to be played by economists who critique existing models that prescribe inaction (e.g., Ackerman and Finlayson 2006; Stanton 2010; Ackerman and Munitz 2011), it would be a profound mistake to think that creating models *prescribing* action would do much, by itself, to avert catastrophe. Models—unlike emotions, moral imagination, and the stories that generate them—simply do not motivate. What gives "go slow" economic models their current power in directing (in)action is not the elegance of their equations (though this does create a barrier-to-entry effect, putting them seemingly beyond the critique of non-economists and non-mathematicians). Rather, they are but one small part of a general narrative of "costs," "price increases," and "job losses"—said to arise if mitigation efforts interfere with the engine (note the mechanical metaphor) of GDP growth. This narrative is being widely hyped throughout our culture by powerful coal, oil, and other interests with something to lose.

Can the powers of fear and story-telling be abused? Absolutely. We have seen this to the *n*th degree in the United States, in fear-inspiring narratives of "weapons of mass destruction" and color-coded terrorism alerts. Do we need to continue to think rationally about outcomes and weigh risks, in cases where this can be productively accomplished?

Absolutely. Nothing in the above should be taken as supporting an abandonment of reason in favor of "anything goes" emotionalism and con-artist storytelling. But what is the alternative to using emotional energy and effective storytelling to get societies moving on climate change? Letting things proceed with "business-as-usual" is profoundly unsafe. Attempting to create motivation through strictly cool, rational processes is profoundly ineffective. There is no rational, clockwork, safe world to which we can retreat from this dilemma, brushing messy decisions off our hands. The question is not whether to tap emotions and narratives or not, but how to come up with *good* and *useful* ones that foster the sorts of changes that are needed.

Perhaps, it might be argued, that while all this is necessary, it is not the role of economists to work on narratives. Such a view, however, ignores the fact that contemporary mainstream economics *is* a narrative (McCloskey 1985), and an extremely culturally powerfully one at that. While we are accustomed to hiding the story under layers of physics-emulating math, the story we tell is about a fictional world of mechanism and control, where a focus on small (marginal) changes is appropriate. When we use such a story in our research or teaching we should, given the contemporary state of the world, be required to attach a large red health-warning label. And in particular, we should flag the part of the story that glamorizes individual self-interested choice.

4. We Must Work Together

In response to Republican rhetoric on health care, climate change, and nearly every other issue that has recently come before the United States Congress, the parody on-line magazine *The Onion* recently suggested a scenario: A massive asteroid is hurtling towards earth, threatening massive conflagrations and extinctions. The "article" quotes

fictional Republican congresspersons arguing that government spending on trying to change the asteroid's course would involve "big government" and "lost jobs." "We believe" they state, "that the decisions of how to deal with the massive asteroid are best left to the individual" (The Onion 2011).

While the fundamental unit of both Neoclassical economics and analytical philosophy is the human individual, and a fundamental ethical value is that of individual freedom, mitigation of climate change requires action on a vastly broader scale. Not only must people cooperate within communities and nations, but across national boundaries. We need to work together. Our abilities to think about how we might do this, however, are hampered by Enlightenment Beta habits of narrowing focusing on the single value of individual freedom, to the exclusion of other values.

In particular, the long-running central narrative of economics has contributed greatly for the current U.S. sentiments in favor of permissive indulgence of economic self-interest and the radical weakening of regulation or any form of centralized government power. Although Adam Smith would no doubt be greatly alarmed to see the exaggeration and distortion this particular idea of his has suffered over the centuries, the story about the "invisible hand" of decentralized markets making individual self-interest serve the social good has become not only an economic but also a political and cultural mantra. Markets, it is now believed, vacate the necessity for ethics or shame.

Much as we, as economists, may try to nuance this story of radical self-interested individualism by pointing to insights about externalities and public goods, those are usually part of Lesson 2 (or, more likely, in Chapter 14), and only picked up on by our better students. Lesson 1, from the way we currently teach economics—and blared

incessantly from right-wing blogs and institutes—is that social cooperation is not necessary, and even becomes detrimental (i.e., freedom-reducing) in a competitive-market-based, GDP-growth aspiring, economy. For keeping this as Lesson 1, our discipline carries a good deal of responsibility for the cultural shift towards radical individualism that underlies the current failure of climate policy.⁶ We have actively helped to create a climate of, as Amartya Sen and Jean Drèze expressed it (in the context of global hunger), "complacent irresponsibility" (1989, 276).

A second legacy of Enlightenment Beta is a preference for thinking in terms of easily separable, analytically-well-defined concepts, and ignoring actual multi-level interdependencies and feedback loops. When pressed to go beyond the assumption that people are self-interested, we may flip to an opposite assumption of altruism. When we find that pure free markets do not work quite right, we flip to an assumption of top-down public policy-making. In political philosophy, either we have a participatory democracy based on rational conversation, or we have oppression. Let us re-examine these Enlightenment Beta assumptions, first at the level of individual propensities for or against cooperation, and then at the level of social organization.

Not Just "Altruism"

Within economics, "self-interest" is thought of in terms of a utility function that includes only one's own consumption (including, perhaps, leisure and various intangibles), while "altruism" is represented by a utility function that includes the utility (or consumption) of others. This totally inadequate vocabulary severely distorts our thinking, directing attention away from our fundamental physical, social, and emotional

⁶ See Frank, Gilovich et al. (1993) for evidence that economics teaching has this effect.

interdependences—as well, as many others have pointed out, from issues of what really gives us satisfaction (Haidt 2006).

The term "altruism," in fact, is given the impossible duty of covering everything from my taking minor notice of your interests as a way of furthering my own "enlightened" self-interest, to you sacrificially throwing yourself in front of a bus to save a child's life. More nuance is clearly required, and particularly in the context of the issue of climate change where the nature of our interdependence with future generations is rather different from that across contemporary people and nations.

The issue of how the current generation interacts with future generations is characterized by extreme non-reciprocity.⁷ Future generations cannot give us anything in return for actions we may take out of our concern with their well-being. They are in our power, and what sort of world they will have to live in is vitally dependent on our actions. Something more than enlightened self-interest is clearly required to motivate action in this situation, and liberal theories of ethics based on reciprocal relations among agents of equal status are hopelessly inadequate to this task.

Fortunately, scholars who study moral action cross-culturally have identified individualistic principles as only one cluster among three that tend to inspire and inform cultural moral codes. Individualistic principles are concerned with individual goals, reciprocity, and non-harming. The second cluster revolves around community, loyalty, in-groups, hierarchy, and wise leadership. The third emphasizes divinity and purity (Haidt 2006, 188; Gigerenzer 2007, 187). What is striking about these later two clusters, to one coming from an Enlightenment Beta background, is their radically un-self-centered core. There is a sense in these that something is *demand*ed of us, rather than

⁷ In Nelson (2005) I call this "asymmetric mutuality."

merely subject to our choice or created in order to further our individual freedom. Unlike individual goals that can be traded off, issues related to community and purity are usually perceived of as in some way non-negotiable and absolute—or, as put by scholar of decision-making Gerd Gigerenzer, "not up for sale" (2007, 206). In the global scheme of things, our Western—and more specifically, U.S. and secular academic—predilection to emphasize only one of these clusters is a historical and geographical anomaly.⁸

Can the moral clusters around community and divinity serve oppressive ends? Certainly. Enlightenment Beta was in some sense a highly progressive force, given the oppressive nature of feudal political and religious hierarchies, supported by rigid social roles and belief in the divinely-endowed rights of patriarchs. Modern-day NIMBY (not-in-my-backyard) or racist in-group sentiments and religious fundamentalism likewise obstruct many rational (in the broad sense of reasonable) projects.

Should individualist ethics be entirely thrown over in favor of community and purity? Certainly not. Individual rights are important, even if they are not all-important. The point of this essay is not to reverse course, nor even that we need to seek to introduce somewhat more consideration of other ethical clusters into our social decision making. Rather, I want to make the empirical point that such clusters *already* function in social decision making. For example, many economists' allegiance to seeing behavior exclusively in terms of utility or profit maximization, in spite of all evidence to the contrary, is arguably motivated along these lines: Feelings of in-group professional loyalty and/or implicit beliefs in (Divine) Reason could go a long way in explaining such puzzling behavior. At the other pole of environmental discussions, philosopher Robert E.

⁸ While U.S. culture seems to draw less from these later two than many other cultures, they are not completely absent: "Ask not what your country can do for you," President John F. Kennedy famously exhorted, "but what you can do for your country."

Goodin's revulsion towards pollution permits seems to be based in a purity ethic (Goodin 2010, 241), as may be the positions of many who equate "nature" with "wilderness" (e.g., McKibben 1989). Values clustered around community and purity have not received adequate attention within academic individualist-oriented economics and philosophy not because they don't already exist, but because of Beta-induced blindness says they *should* not exist.

What does climate change *demand of us*? The phrasing of the subtitle of this essay was very deliberately chosen. Hans Jonas, after extensive discussions of Enlightenment Beta ethical axioms, "the idea of Man" (1984, 43), rational principles, Kant, and so on in his *Imperative of Responsibility*, ultimately claims that the type of ethics that we need comes from quite a different source:

[A]ll proofs of validity for moral prescriptions are ultimately reduced to obtaining evidence of an 'ontological' ought...[W]hen asked for a single instance...where the coincidence of 'is' and 'ought' occurs, we can point at the most familiar sight: the newborn, whose mere breathing uncontradictably addresses an ought to the world around, namely, to take care of him. Look and you know. (Jonas 1984, 130-31)

That is, "the always acute, unequivocal, and choiceless responsibility which the newborn claims for himself" creates "the ought-to-do of the subject who, in virtue of his power, is called to its care" (Jonas 1984, 134, 93). Rather than simply grounding a "formal" responsibility or accountability for deeds, the newborn demands of us a "substantive" responsibility for care. The sight of the newborn is specific, emotional, and moves us in some sense out of ourselves. Its demand is grounded not in notions of independent agents, but in a recognition of the infant's profound aliveness and profound fragility. It is grounded in a visceral perception of the deep interdependence of life, and the totally

inegalitarian distribution—between the parent and the newborn—of the power to act to support and sustain that life.

This insight does not, of course, immediately generalize to all situations of adults and children, or to the situation of generation and future ones, or situations of rich and poor. But perhaps it contains the seed for the recognition of common humanity and substantive responsibilities for care. It is not a notion of simple "altruism," neither in the economists' usual sense (since the adults "preferences" are rather beside the point) nor in the sense of selfless sacrifice (since the adult remains—and must, for the sake of the newborn, function as—an individual). The necessary ethic for us in regard to future generations has more to do with Amartya Sen's "commitment" than with his "sympathy" (1977).⁹

But what of our relations to others of our current generation, with whom climate change demands that we cooperate? Here reciprocity among similarly situated people—as well as non-reciprocal care towards people with less power—is also involved. If we assume that people (and nations) are purely self-interested and prone to free riding, then of course the situation is largely hopeless. The costs climate change will inflict on the currently powerful are not enough to "incentivize" change. Calls for personal virtue and individual radical lifestyle change, on the other hand, while popular among the idealistic (and especially the young and idealistic) rely on an opposite assumption that individuals will act from their highest principles no matter how other similarly-situated people act. Yet empirical evidence demonstrates that many very concerned people, have not (yet, at

⁹ Perhaps more acceptance by scholars of climate change of such *demands on us* would also help create better ties with citizens of somewhat more traditional cultures abroad and moderate religious segments of the United States. A haughty attitude of superior secularism, and out-of-hand dismissal of the sorts of rituals and practices that encourage communal and spiritual identities, does not win us friends.

least) become car-less, non-flying, vegetarian locavores, perhaps because we have noticed that such individual changes are more symbolic than substantive until larger social and structural issues are addressed. What is to be done?

Here some very simple broadening of economists' assumptions about human ethical motivations may be of service. Howard Margolis (1982) suggested that a model of human behavior as "neither selfish nor exploited" ("NSNX") corresponds better to actual behavior than either assumptions of pure self-interest or pure sacrificial altruism.

Business scholar J. Gregory Dees and economist Peter Cramton similarly have proposed a tripartite structure that delineates among opportunists (pure egoists), moral idealists (pure altruists), and what they call "pragmatists," or people who "are willing and able to constrain their self-seeking behavior for moral reasons, provided that they can be reasonably sure that others with whom they are interacting will do so as well" (1991, 146). Business ethicist Mary Gentile has, in practice, found that most people identify themselves along the "pragmatist" lines. Furthermore, she claims, what these people need to enact their more pro-social values is not a better knowledge of ethical principles, but actual practice in physically *giving voice* to these values and in strategizing about how to make them *effective* (Gentile 2010, 109)—perhaps, rehearsal-like, in advance of the situations in which ethical actions are needed. Institutional economist have, of course, for generations now emphasized that societies shape individuals at the same time that individuals shape societies. This literature suggests that working with ethics as a question of actual social, concrete, active, trust-based and goal-directed behavior could take us down more helpful roads than discussions of private incentives or individual virtue.

Some evidence on how social values are created, and changed, already exists, and the evidence, again, does not bode well for theories of disembodied rational agents. As Haidt writes, investigation into the shaping of moral judgments suggests that "[c]ultural knowledge is a complex web of explicit and implicit, sensory and propositional, affective, cognitive, and motoric knowledge" (2001, 827). Gigerenzer suggests that moral intuitions are a sort of unconscious "moral grammar," built up within particular social environments and having emotional goals, and taking the form of gut feelings or rules of thumb (2007, 185).¹⁰

Consider, for example, why soldiers practice marching in formation for hours, often chanting at the same time. I had always assumed this was merely a matter of practicing moving efficiently from Point A to Point B until my attention was drawn to "motoric" knowledge and the bodily enculturation of moral values by this literature. Drawing on work by neuroscientist Andrew Newbury, Haidt points out that repetitive motor activities and chanting have been used throughout history to create "resonance patterns" among people and that lead to feelings of group harmony and cohesion. (2006, 237). Similarly, behavioral scientists, including economists, have found that the creation of apparently substantively meaningless group identifications among experiment subjects (e.g., assignment to a "team" that never works together) can create in-group feelings.

¹⁰ Exactly how specific environmental structures (e.g., default rules, incentives, framing factors, feedback or lack thereof, and peer pressure) can have been interestingly demonstrated in two recent explorations. Gigerenzer reports on the analysis of the judgments of a group of English magistrates. While perceiving themselves as making complex and rational decisions in the service of justice, the magistrates in actuality acted more in accord with a goal of not being blamed for bad releases of criminal suspects. Kitcher, in a refreshing change from philosophies of science that treat science as a pure search for truth, takes into account the more personal goal of a scientist to be "the one who found out the truth" (2011, 238), and looks at the implications of this for that social project. A similar study of economists does not come to mind, though a brief study by Margolis suggests that economists are just as prone to the errors of logic that rational choice theorists disdain (Margolis 1982).]

Can such use of embodied, affective, in-group-oriented rituals and perceptions be abused? Of course. Historically, the next step after creating military cohesion has been to go attack some other group. Yet what we—we, as a global humanity—need to in order to gain a sense of confidence and mutual trust is exactly some heightened recognition of our common identity. The issue, again, is not *whether* such techniques are used—advertisers have been exploiting them left and right for decades—but *how* they will be used. There is no safe alternative. Our choices are not between group loyalty and pure individual freedom, but about what kind of group loyalties our culture—and more specifically, our discipline—encourages.

More than "Conversation"

At a more structural level, if we can't count on the market to coordinate our actions in a morally appropriate direction, what can we trust? Perhaps the public sphere, considered to be an ideal realm of deliberation?

A number of philosophers who encourage immediate, ethically-grounded action on climate change base their arguments in the idea of an ideal human conversation or ideal participatory democracy in which all views are expressed. Philosopher of science Philip Kitcher has recently given cogent arguments, for example, about the inescapability of ethical questions, grounded in such a conversational narrative (2011).¹¹ Environmental

¹¹ Kitcher writes, for example, that "...our Paleolithic predecessors sat down together to decide on the precepts for governing their group life" (2011, 42). Relevant to the discussion of the previous section, Kitcher also seems to prioritize reason over emotion when thinking about human motivation. Kitcher assumes that his human conversationalists—in their weighing of benefits and economic costs—are more moved by the idea of harm to future humans than by issues of species extinction, so that the moral focus should be on the former (2011, 296-7). Yet it seems, empirically, that people are—for better or (mostly, from a humanitarian viewpoint) worse—often more moved by the plight of their pets, to whom they have emotional attachments, and by the plight of big-eyed animals that bring out protective feelings, than by human suffering abroad (especially chronic poverty). While it may be fashionable, from the point of view of ethical principles, to disdain the human tendency to focus on "charismatic metafauna" such as baby seals

philosopher Dale Jamieson similarly emphasizes participatory democracy (2010, 84). Economist Partha Dasgupta has suggested (in relation to global poverty) that there is a hard-and-fast dichotomy between the market sphere, in which "we should not worry about others" and the public sphere in which such worry and ethical concern is appropriate (2005, 247; 2007, 151). Dasgupta puts his hope in "well-ordered" democracies with civic education and rational voting rules that, as far as possible, properly aggregate individual preferences (2007, 152).

Is there not some sense, however, in which such an image of an ethics-creating process engaged in by cooperating, rational, adult conversationalists, in fact assumes its own result? What would it take, in the real world, to get adults sitting at a table (or, perhaps, squatting under a tree), unarmed, adequately nourished and reasonably healthy, speaking a common language, willing to put time into the effort, and respectful of others' contributions to the mutual conversation? As a more skeptical philosopher notes, "the homogenized--you might say sterilized--rational subject" who settles things through conversation and rational deliberation is apparently "not prey to ambivalence, anxiety, obsession, prejudice, hatred, or violence" (Meyers 2010). Two elements that seem to me to be lacking from discussions centered around "conversation" are first, leadership, and second, habit and custom.

Our working together can also come through moral and political leadership—on scales from the very local, through communities, through religious and educational

and polar bears, from the point of view of ethical motivation it is not so clear that a vivid description of the effects of climate change on Fido and Whiskers would be out of place.

organizations, through companies,¹² and on up through states and nations and global fora. Leading means being willing to get out in front of the pack. Leading means working to create those shifts that will give ethical "pragmatists" the confidence to do the right thing. I was greatly surprised, in conversing a few years back with a noted environmental philosopher, that while he had adopted rather radical lifestyle changes himself in response to climate change, he felt he had no obligation, or even right, to encourage others to do the same. In his role as resident ethicist in various working groups on climate change, he shied away from any intervention that might carry a whiff of prescription or exhortation—that is, from any role as a leader rather than as a "neutral" expert.

Can leadership be abused? No doubt. Hitler and Pol Pot immediately spring to mind, and there are countless other horrific examples. One can only be glad, however, that Gandhi, Martin Luther King, Harriet Beecher Stowe and others were not so overly scrupulous. The only alternative to bad leadership is not radical decentralization and (perhaps impossible) ideal democratic conversations. *Good* leadership is also possible—and necessary.

Habits, customs, and other widely spread practices are also ways of generating and sustaining cooperation. Nobel Laureate Elinor Ostrom's work on governance of the commons, for example, points towards the role of relatively decentralized and informal rules, institutions, and trust-creating processes in supporting appropriate community behavior (1990). A recent book by Harvard scholar Elaine Scarry suggests that the urgency of a crisis need not be taken as a sign that it requires centralized, top-down action. Rapid response, she suggests, can also come from "practices that we dismiss as

¹² The idea that companies are immune from ethical concerns because their nature is to maximize profits is a creation of economists—strongly preached by Milton Friedman, and weakly preached in all orthodox economics classes. It does not need to be believed (Nelson forthcoming).

mere habit and protocol" (2011). The routes to change suggested by the creation of habits of household recycling, for example—or even the spread of the sometimes-ridiculed "bring your own shopping bag" practice—might, in this sense, hold more promise for action on climate change than their current actual impact on the problem (exceedingly small) would suggest.

Nicholas Stern writes that focusing on issues of "credibility, trust and mutual confidence" as well as on "how to foster change" are critical for moving forward on climate issues (2011, 10). While economists should not completely drop our more conventional efforts towards advising on national-level regulation and international agreements, such levels of action cannot be the whole story about learning to work together. Particularly when those avenues seem, as in the United States at present, to be largely blocked, as social scientists economists could also contribute to action by directing attention to these other avenues of change. At the very least, we could stop preaching their neglect, by including in our textbooks only self-interested individuals.

5. We Must Focus on Avoiding the Worst

In a mechanical, safe, rational, and certain world, we can strive to achieve the very best. If, conveniently, that world is also characterized by smoothly differentiable functions and small changes, we can optimize using techniques of calculus. We can build mathematical models pointing the way to maximum efficiency, and forecast the future using our models and data from the past. Such Enlightenment Beta "early stage" (to quote Marshall, above) approaches, however, do not provide guidance for dealing with living complexities and potentially catastrophic change.

In his recent bestseller, *The Black Swan*, professor and trader Nassim Nicholas Taleb has taken the discipline of economics harshly (though also, in a dark way, amusingly) to task for this neglect (2010). Taleb convincingly argues that history is mainly created by large and fundamentally unpredictable events—Black Swans (e.g., inventions and revolutions)—rather than small events that follow appealing narratives of cause and effect. Just as every day that it gets fed confirms a turkey's narrative about the beneficence of human beings, so that it is not prepared for the Wednesday before Thanksgiving (40), we are deceived if we think we can predict the future. Mainstream economics' emphasis on mechanistic modeling and econometrics is, Taleb claims, therefore not just somewhat beside the point but actively harmful. By directing people's attention to optimization and efficiency, we have distracted them from true uncertainty. The denial of Black Swans leads to the creation of fragile social and economic systems—systems that are designed to be "optimal" relative to what we know, but which are extremely vulnerable to what we do *not* know (321). The financial crisis of 2008 thus, Taleb writes, was actually not a Black Swan, but instead a somewhat predictable Grey Swan: "You know with near certainty that a plane flown by an incompetent pilot will eventually crash" (321).

Taleb, along with economist Weitzman, is bringing to economic and popular attention the notion of "fat tails" in probability distributions. While most economic models that include uncertainty assume that the probability of rare events falls off quickly and smoothly, in a world with "fat tails" there may lurk a rare, never-before-experienced event of huge magnitude. The usual expected utility approach of adding up the values of outcomes multiplied by their associated probabilities falls apart in this case (Taleb 2010;

Weitzman 2011; see also "dread risk" in Gigerenzer and Fiedler undated). This does not mean, however, that there is no rational way of responding. Rather, the rational response is to "invest in preparedness, not in prediction" (Taleb, 2010, 208). The rational response is to pay attention to the size of the consequences, not the size of the (unknowable) probabilities, and then try to "mitigate the consequences" (Taleb, 2010, 211).

Epistemic humility, mentioned earlier in this essay as a characteristic of the needed Enlightenment 2.0, is a thoroughly necessary and rational response to the existence of unpredictable worst cases. In regard to climate change, Taleb writes,

The position I suggest should be based both on ignorance and on deference to the wisdom of Mother Nature, since she is older than us, hence wiser than us, and has been proven much smarter than scientists. We do not understand enough about Mother Nature to mess with her...we are facing nonlinearities and magnifications of errors...we need to be hyper-conservationists ecologically...the burden of proof is...on someone disrupting the old system. (Taleb, 2010, 315-16)

Elsewhere he refers to "elephant matriarchs" (78) and "grandmothers" (332) as the keepers of long-time-frame, conservative, life-preserving wisdom (in contrast to the "institutionalized frauds" (210) of neoclassical economics). Redundancy, Taleb writes, is "the opposite of" optimization and efficiency, and is the key component of this wisdom (312).

Epistemic humility, however, is in very short supply in some areas of environmental economics and policy. Belief in salvation by massive geoengineering, for example—attempting to solve a problem caused by our ignorance and hubris by adding more of the same—is a thoroughly Enlightenment Beta-inspired project. More crucially, in relation to current U.S. environmental policy, it is in short supply in the White House Office of Information and Regulatory Affairs. Cass Sunstein, administrator of this office

and noted contributor to legal philosophy, has recently derided the Precautionary Principle—alluded to at the end of the Taleb quote above—as rigid ("paralyzing") and unworkable (2002-2003; 2005). He seems to miss the point of this principle, which in spirit is an admonition to be humbly careful about messing around with complex natural systems that we do not really fully understand. Adhering to the idea that all principles must be logically crisp and clear, Sunstein reinterprets the Precautionary Principles as essentially another version of economists' Pareto Efficiency criterion: Because there are risks "on all sides of social situations," an admonition to do no harm to anyone (like an admonition to leave everyone at least as well off), he writes, "will be paralyzing, forbidding any imaginable step, including no step at all" (2002-2003, 32). He dismisses the tendency of people to focus on outcomes and neglect probabilities (which Taleb, Weitzman, and Gigerenzer argue can be a wise move in some cases) as simply an unfortunate psychological anomaly, and blithely assumes that unknown probabilities arise only in regard to natural systems only in "special circumstances" (2005, 114).¹³ Sunstein appears to believe we live in a fundamentally safe and predictable world.

Does this need for epistemic humility mean that, for ethical reasons, Neoclassically-trained economists need to give up our usual modes of analysis? I have, above, mentioned a defensive role for using such tools to counteract go-slow arguments framed in the same mode. I would also acknowledge that techniques such as cost-effectiveness analysis could play something of a role in the evaluation of specific alternative projects, once mitigation (and adaptation) efforts are underway. Yet I think the

¹³ Other economic approaches are also apparent in his work—for example, ideas that (à la Schelling) a loss of agriculture in wealthy countries would not hurt much because it is a small proportion of GDP (Sunstein 2002-2003, 36), and a pervasive cost-benefit tradeoff and individual freedom frame (Sunstein 2005).

primary message of climate change—and Enlightenment 2.0—is that our profession requires a major shift.

6. Concrete Steps

Let me suggest a few major themes that could be immediately incorporated in economists' work, in our roles as researchers, public intellectuals, teachers, consultants, reviewers of papers and grants, and all our other roles:

- Be willing to take an ethical stand on climate change. There is no place to hide from this. Economists don't contain some kind of ethereal, neutral economist part that exists separately from our human bodies and human responsibility.
- Regard economics as being about provisioning—that is, the way societies organize themselves to provide for the sustaining and flourishing of life.¹⁴ This avoids the dead ends inherent in notions centered around rational choice or markets—and also corresponds better to what outsiders believe they are paying us to help them with.
- Spread the world that economics is not just about self-interest and accumulating more goods. Behavioral economics, the economics of happiness, and the economics of interpersonal relations may be of some help here.¹⁵ While this may mean breaking our old professional habits, it will, in fact, make us seem more sane to outsiders.
- Become more active in researching how—structurally, institutionally, culturally, and morally—people come to take action, work together, and avoid catastrophe.

¹⁴ This definition has been used by Institutional, social, and feminist economists (e.g., Nelson 1993).

¹⁵ For example, Camerer, Loewenstein et al. (2003), Kahneman (2003), Gui and Sugden (2005), Frey (2008), and Gui and Stanca (2010).

Instead of dreaming up ideal structures in our heads, could we get involved in the actual investigative study of structures of resilience and robustness?

- In regard to the environment, include conservative—in the sense of precautionary—viewpoints in our work and teaching. Adding "resource maintenance" to the usual list of main economic activities (production, distribution, and consumption) is a start.¹⁶
- Include a healthy respect for uncertainty and danger in your work—and respect for the aliveness that demands our care giving response.

This list is not meant to be exhaustive or timeless. If nothing else, at sometime Enlightenment 3.0—should humans survive to see it—will require different perspectives and priorities.

7. Conclusion

The world we live in is profoundly unsafe, interdependent, and uncertain. Economics that neglects these facts—or, even worse, distracts us from them with stories about mechanism and predictability—does harm. It is high time for economics to catch up both with science, and with social needs, and become a positive force in dealing with climate change.

8. Coda

There is one quite obvious reason for the evident resistance to updating Enlightenment Beta that I have declined to expound on in this essay. Feminist philosophers and economists have long noted the alignment between Enlightenment Beta

¹⁶ This approach is used in teaching materials from the Global Development and Environment Institute (e.g., Goodwin, Nelson et al. 2008).

ideals and dominant cultural understandings of masculinity (e.g., Keller 1985; Nelson 1995). It is both encouraging and irksome to see some realization of this coming out in some of the above-referenced literature, but with no acknowledgement of the work already done by feminist scholars. Taleb's positive valuation of Mother Nature, grandmothers, and matriarchs and Gigerenzer's revaluing of stereotypically female "intuition" (2007, 69-73) for both men and women are striking examples of some of the gender-challenging aspect of Enlightenment 2.0 approaches. When Jonas sees critical ethical importance in a parent's response to a newborn, he briefly notes that this is most strongly experienced by "the childbearing part of humanity" (1984, 39). These recoveries of long-neglected parts of human experience are reminiscent of extensive feminist work on the moral philosophy and economics of care (e.g., Ruddick 1989; Folbre 2001; Meyers 2010). It is simply irksome to see critiques expressed as new that in fact shadow earlier feminist-raised issues. For example, Haidt's critique of conventional notions of moral reasoning does not even mention Carol Gilligan's earlier influential critique and the resulting controversies (Gilligan 1982; Jaffee and Hyde 2000), and volumes may have male-only author lists (Gardiner, Caney et al. 2010) when prominent female and feminist authors—e.g., Chris Cuomo (2005), Nancy Tuana (Brown, Lemons et al. 2006), and Karen Warren (2000)—could have been included. The point is not that "women do it differently," but that, having been excluded from Enlightenment Beta-inspired fields at the time their scholarly cultures were created, women have been better positioned to notice the one-sidedness of the ideals that became engrained. However, as even prominent women directing important U.S. economic offices have experienced—see the

comments of Sheila Bair, chair of the FDIC (Scherer 2010)—it is still the case that what a woman says is often not heard until a man repeats it. Or until a disaster occurs.

J. A. Nelson is a Senior Research Fellow at the Global Development and Environment Institute, Tufts University, and an Associate Professor of Economics at the University of Massachusetts, Boston. She received her Ph.D. in Economics from the University of Wisconsin. Inquiries can be directed to Julie.Nelson@tufts.edu.

REFERENCES

- Ackerman, F., 2009. *Can We Afford the Future? The Economics of a Warming World*. Zed Books, London.
- Ackerman, F. and I. Finlayson, 2006. The Economics of Inaction on Climate Change: A Sensitivity Analysis. *Climate Policy* 6 (5), 509-526.
- Ackerman, F. and C. Munitz, 2011. Climate Damages in the FUND Model: A Disaggregated Analysis. *Economists for Equity and the Environment*.
- Broome, J., 2006. Valuing Policies in Response to Climate Change: Some Ethical Issues. Supporting Research for the Stern Review on the Economics of Climate Change, http://www.hm-treasury.gov.uk/media/5/0/stern_review_supporting_technical_material_john_broome_261006.pdf.
- Broome, J., 2008. The Ethics of Climate Change. *Scientific American* (June), 97-102.
- Brown, D., J. Lemons, et al., 2006. The importance of expressly integrating ethical analyses into climate change policy formation. *Climate Policy* 5, 549-552.
- Camerer, C.F., G. Loewenstein, et al. (Eds.), 2003. *Advances in Behavioral Economics*. Princeton, Princeton University Press.
- Cuomo, C., 2005. Ethics and the Eco/Feminist Self, in: M. E. Zimmerman, J. B. Callicot, K. J. Warren, I. J. Klaver and J. Clark (Eds.), *Environmental Philosophy: From Animal Rights to Radical Ecology*. Pearson Prentice Hall, Upper Saddle River, pp. 194-207.
- Damasio, A.R., 1994. *Descartes' Error: Emotion, Reason, and the Human Brain.*, G.P. Putnam's Sons, New York.
- Damasio, A.R., 1997. *Exploring the Minded Brain. The Tanner Lectures on Human Values*.
- Dasgupta, P., 2005. What do Economists Analyze and Why: Values or Facts? *Economics and Philosophy* 21, 221-278.
- Dasgupta, P., 2007. *Economics: A very short introduction*. Oxford University Press, Oxford.
- DeCanio, S.J., 2003. *Economic Models of Climate Change: A Critique*. Palgrave Macmillan, New York.
- Dees, J.G. and P.C. Cramton, 1991. Shrewd Bargaining on the Moral Frontier: Toward a Theory of Morality in Practice. *Business Ethics Quarterly* 1 (2), 135-167.
- Dietz, S. and N. Stern, 2008. Why economic analysis supports strong action on climate change: A response to the Stern Review's critics. *Review of Environmental Economics and Policy* 2 (1), 94-113.
- Dijksterhuis, A., M.W. Bos, et al., 2006. On Making the Right Choice: The Deliberation-Without-Attention Effect. *Science* 311 (5763), 1005-1007.
- Drèze, J. and A. Sen, 1989. *Hunger and Public Action*. Clarendon, Oxford.
- Folbre, N., 2001. *The Invisible Heart: Economics and Family Values*. The New Press, NY.
- Frank, R.H., T. Gilovich, et al., 1993. Does Studying Economics Inhibit Cooperation? *Journal of Economic Perspectives* 7 (2), 159-171.

- Frey, B.S., 2008. *Happiness: A Revolution in Economics*. MIT Press, Cambridge.
- Gardiner, S.M., S. Caney, et al., 2010. *Climate Ethics: Essential Readings*. Oxford University Press, Oxford.
- Gentile, M.C., 2010. *Giving Voice to Values: How to Speak Your Mind When You Know What's Right*. Yale University Press, New Haven.
- Gigerenzer, G., 2007. *Gut Feelings: The Intelligence of the Unconscious*. Penguin Books, NY.
- Gigerenzer, G. and K. Fiedler, undated. *Mind in Environments: The Potential of an Ecological Approach to Cognition*. Max Planck Institute for Human Development. Berlin.
- Gilligan, C., 1982. In *A Different Voice: Psychological Theory and Women's Development*. Harvard University Press, Cambridge, MA.
- Goodin, R.E., 2010. *Selling Environmental Indulgences*, in: S. M. Gardiner, S. Caney, D. Jamieson and H. Shue (Eds.), *Climate Ethics: Essential Readings*. Oxford University Press, Oxford, pp. 231-246.
- Goodwin, N., J.A. Nelson, et al., 2008. *Macroeconomics in Context*. M.E. Sharpe, Armonk NY.
- Greene, J. and J. Haidt, 2002. How (and where) does moral judgment work? *Trends in Cognitive Science* 6 (12), 517-523.
- Greene, J.D., R.B. Sommerville, et al., 2001. An fMRI Investigation of Emotional Engagement in Moral Judgment. *Science* 293 (Sept 14), 2105-2108.
- Gui, B. and L. Stanca, 2010. *Happiness and Relational Goods: Well-Being and Interpersonal Relations in the Economic Sphere*. *International Review of Economics* 57 (2), 105-118.
- Gui, B. and R. Sugden (Eds.), 2005. *Economics and Social Interaction*. Cambridge, Cambridge University Press.
- Haidt, J., 2001. The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment. *Psychological Review* 108 (4), 814-834.
- Haidt, J., 2006. *The Happiness Hypothesis: Finding Modern Truth in Ancient Wisdom*. Basic Books, New York.
- Howarth, R.B., 2003. Discounting and sustainability: towards reconciliation. *International Journal of Sustainable Development* 6 (1), 87-97.
- Iacoboni, M., 2008. *Mirroring People: The New Science of How We Connect with Others*. Farrar, Straus and Giroux, New York.
- Iyengar, S.S. and M.R. Lepper, 2000. When Choice is Demotivating: Can One Desire Too Much of a Good Thing? *Journal of Personality and Social Psychology*, 79 (6), 995-1006.
- Jaffee, S. and J.S. Hyde, 2000. Gender Differences in Moral Orientation: A Meta-Analysis. *Psychological Bulletin* 126 (5), 703-726.
- Jamieson, D., 2010. *Ethics, Public Policy, and Global Warming*, in: S. M. Gardiner, S. Caney, D. Jamieson and H. Shue (Eds.), *Climate Ethics: Essential Readings*. Oxford University Press, Oxford, pp. 77-86.
- Jonas, H., 1984. *The Imperative of Responsibility: In Search of Ethics for the Technological Age*. University of Chicago Press, Chicago.
- Kahneman, D., 2003. *Maps of Bounded Rationality: Psychology for Behavioral Economics*. *American Economic Review*, 1449-1475.

- Keller, E.F., 1985. *Reflections on Gender and Science*. Yale University Press, New Haven, Conn.
- Kitcher, P., 2011. *Science in a Democratic Society* (Book Manuscript, forthcoming). Prometheus Books,
- Lakoff, G., 2004. *Don't Think of an Elephant! Know Your Values and Frame the Debate*. Chelsea Green, White River Junction, VT.
- Lakoff, G. and M. Johnson, 1999. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. Basic Books, NY.
- Margolis, H., 1982. *Selfishness, Altruism, and Rationality: A Theory of Social Choice*. University of Chicago Press, Chicago.
- Marshall, A., 1898. *Distribution and Exchange*. *Economic Journal* 8 (29), 37-59.
- McCloskey, D.N., 1985. *The Rhetoric of Economics*. University of Wisconsin Press, Madison, WI.
- McKibben, B., 1989. *The End of Nature*. Random House NY.
- Meyers, D., 2010. *Feminist Perspectives on the Self*, in: E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (electronic). URL = <http://plato.stanford.edu/archives/spr2010/entries/feminism-self/>.
- Nelson, J.A., 1993. *The Study of Choice or the Study of Provisioning? Gender and the Definition of Economics*, in: M. Ferber and J. A. Nelson (Eds.), *Beyond Economic Man*. University of Chicago Press, Chicago, pp. 23-36.
- Nelson, J.A., 1995. *Feminism and Economics*. *Journal of Economic Perspectives* 9 (2), 131-148.
- Nelson, J.A., 2005. *Interpersonal relations and economics: comments from a feminist perspective*, in: B. Gui and R. Sugden (Eds.), *Economics and Social Interaction*. Cambridge University Press, Cambridge, pp. 250-261.
- Nelson, J.A., forthcoming. *Does Profit-Seeking Rule Out Love? Evidence (or Not) from Economics and Law*. *Washington University Journal of Law and Policy*.
- Ostrom, E., 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press,
- Putnam, H., 2003. *For Ethics and Economics Without the Dichotomies*. *Review of Political Economy* 15 (3), 395-412.
- Ruddick, S., 1989. *Maternal Thinking: Toward a Politics of Peace*. Beacon Press, Boston.
- Scarry, E., 2011. *Thinking in an Emergency*. W.W. Norton & Company, NY.
- Scherer, M., 2010. *The New Sheriffs of Wall Street*. Time.
- Sen, A., 1977. *Rational Fools: A Critique of the Behavioral Foundations of Economic Theory*. *Philosophy and Public Affairs* 6 (Summer), 317-44.
- Stanton, E., 2010. *Negishi welfare weights in integrated assessment models: the mathematics of global inequality*. *Climatic Change* (Online).
- Stern, N., 2011. *How Should We Think About the Economics of Climate Change?*, http://www.ase.tufts.edu/gdae/about_us/leontief/SternLecture.pdf. Lecture for the Leontief Prize. Medford, Global Development and Environment Institute.
- Sunstein, C.R., 2002-2003. *The Paralyzing Principle*. *Regulation Winter*
- Sunstein, C.R., 2005. *Laws of Fear: Beyond The Precautionary Principle*. Cambridge University Press, NY.
- Taleb, N.N., 2010. *The Black Swan: The Impact of the Highly Improbable*. Random House, NY.

- The Onion, 2011. Republicans Vote To Repeal Obama-Backed Bill That Would Destroy Asteroid Headed For Earth. *The Onion* (47-05).
- Warren, K.J., 2000. *Ecofeminist Philosophy: A Western Perspective on What It Is and Why It Matters*. Rowman & Littlefield Lanham, Maryland.
- Weitzman, M.L., 2009. On Modeling and Interpreting the Economics of Catastrophic Climate Change. *The Review of Economics and Statistics* 91(1), 1-19.
- Weitzman, M.L., 2010. GHG Targets as Insurance Against Catastrophic Climate Damages. Working Paper, Harvard University.
- Weitzman, M.L., 2011. Fat-Tailed Uncertainty in the Economics of Catastrophic Climate Change. REEP Symposium on Fat Tails. Cambridge, Harvard University.
- Williams, L.E. and J.A. Bargh, 2008. Experiencing Physical Warmth Promotes Interpersonal Warmth. *Science* 322, 606-607.

The Global Development And Environment Institute (GDAE) is a research institute at Tufts University dedicated to promoting a better understanding of how societies can pursue their economic goals in an environmentally and socially sustainable manner. GDAE pursues its mission through original research, policy work, publication projects, curriculum development, conferences, and other activities. The "GDAE Working Papers" series presents substantive work-in-progress by GDAE-affiliated researchers. We welcome your comments, either by e-mail directly to the author or to G-DAE, Tufts University, 44 Teele Ave., Medford, MA 02155 USA; tel: 617-627-3530; fax: 617-627-2409; e-mail: gdae@tufts.edu; website: <http://ase.tufts.edu/gdae>.

Papers in this Series:

- 00-01** Still Dead After All These Years: Interpreting the Failure of General Equilibrium Theory (Frank Ackerman, November 1999)
- 00-02** Economics in Context: The Need for a New Textbook (Neva R. Goodwin, Oleg I. Ananyin, Frank Ackerman and Thomas E. Weisskopf, February 1997)
- 00-03** Trade Liberalization and Pollution Intensive Industries in Developing Countries: A Partial Equilibrium Approach (Kevin Gallagher and Frank Ackerman, January 2000)
- 00-04** Basic Principles of Sustainable Development (Jonathan M. Harris, June 2000)
- 00-05** Getting the Prices Wrong: The Limits of Market-Based Environmental Policy (Frank Ackerman and Kevin Gallagher, September 2000)
- 00-06** Telling Other Stories: Heterodox Critiques of Neoclassical Micro Principles Texts (Steve Cohn, August 2000)
- 00-07** Trade Liberalization and Industrial Pollution in Mexico: Lessons for the FTAA (Kevin Gallagher, October 2000) (*Paper withdrawn- see www.ase.tufts.edu/gdae/ for details*)
- 00-08** Waste in the Inner City: Asset or Assault? (Frank Ackerman and Sumreen Mirza, June 2000)
- 01-01** Civil Economy and Civilized Economics: Essentials for Sustainable Development (Neva Goodwin, January 2001)
- 01-02** Mixed Signals: Market Incentives, Recycling and the Price Spike of 1995. (Frank Ackerman and Kevin Gallagher, January 2001)
- 01-03** Community Control in a Global Economy: Lessons from Mexico's Economic Integration Process (Tim Wise and Eliza Waters, February 2001)
- 01-04** Agriculture in a Global Perspective (Jonathan M. Harris, March 2001)
- 01-05** Better Principles: New Approaches to Teaching Introductory Economics (Neva R. Goodwin and Jonathan M. Harris, March 2001)
- 01-06** The \$6.1 Million Question (Frank Ackerman and Lisa Heinzerling, April 2002)
- 01-07** Dirt is in the Eye of the Beholder: The World Bank Air Pollution Intensities for Mexico (Francisco Aguayo, Kevin P. Gallagher, and Ana Citlalic González, July 2001)
- 01-08** Is NACEC a Model Trade and Environment Institution? Lessons from Mexican Industry (Kevin P. Gallagher, October 2001)
- 01-09** Macroeconomic Policy and Sustainability (Jonathan M. Harris, July 2001)

- 02-01** Economic Analysis in Environmental Reviews of Trade Agreements: Assessing the North American Experience. (Kevin Gallagher, Frank Ackerman, Luke Ney, April 2002)
- 03-01** Read My Lips: More New Tax Cuts—The Distributional Impacts of Repealing Dividend Taxation (Brian Roach, February 2003)
- 03-02** Macroeconomics for the 21st Century (Neva R. Goodwin, February 2003)
- 03-03** Reconciling Growth and the Environment (Jonathan M. Harris and Neva R. Goodwin, March 2003)
- 03-04** Current Economic Conditions in Myanmar and Options for Sustainable Growth (David Dapice, May 2003)
- 03-05** Economic Reform, Energy, and Development: The Case of Mexican Manufacturing (Francisco Aguayo and Kevin P. Gallagher, July 2003)
- 03-06** Free Trade, Corn, and the Environment: Environmental Impacts of US-Mexico Corn Trade Under NAFTA
- 03-07** Five Kinds of Capital: Useful Concepts for Sustainable Development (Neva R. Goodwin, September 2003)
- 03-08** International Trade and Air Pollution: The Economic Costs of Air Emissions from Waterborne Commerce Vessels in the United States (Kevin P. Gallagher and Robin Taylor, September 2003)
- 03-09** Costs of Preventable Childhood Illness: The Price We Pay for Pollution (Rachel Massey and Frank Ackerman, September 2003)
- 03-10** Progressive and Regressive Taxation in the United States: Who's Really Paying (and Not Paying) their Fair Share? (Brian Roach, October 2003)
- 03-11** Clocks, Creation, and Clarity: Insights on Ethics and Economics from a Feminist Perspective (Julie A. Nelson, October 2003)
- 04-01** Beyond Small-Is-Beautiful: A Buddhist and Feminist Analysis of Ethics and Business (Julie A. Nelson, January 2004)
- 04-02** The Paradox of Agricultural Subsidies: Measurement Issues, Agricultural Dumping, and Policy Reform (Timothy A. Wise, February 2004)
- 04-03** Is Economics a Natural Science? (Julie Nelson, March 2004)
- 05-01** The Shrinking Gains from Trade: A Critical Assessment of Doha Round Projections (Frank Ackerman, October 2005)
- 05-02** Understanding the Farm Problem: Six Common Errors in Presenting Farm Statistics (Timothy A. Wise, March 2005)
- 05-03** Securing Social Security: Sensitivity to Economic Assumptions and Analysis of Policy Options (Brian Roach and Frank Ackerman, May 2005)
- 05-04** Rationality and Humanity: A View from Feminist Economics (Julie A. Nelson, May 2005)
- 05-05** Teaching Ecological and Feminist Economics in the Principles Course (Julie A. Nelson and Neva Goodwin, June 2005)
- 05-06** Policy Space for Development in the WTO and Beyond: The Case of Intellectual Property Rights (Ken Shadlen, November 2005)
- 05-07** Identifying the Real Winners from U.S. Agricultural Policies (Timothy A. Wise, December 2005)
- 06-01** The Missing Links between Foreign Investment and Development: Lessons from Costa Rica and Mexico (Eva A. Paus and Kevin P. Gallagher, February 2006)
- 06-02** The Unbearable Lightness of Regulatory Costs (Frank Ackerman, February 2006)

- 06-03** Feeding the Factory Farm: Implicit Subsidies to the Broiler Chicken Industry (Elanor Starmer, Aimee Witteman and Timothy A. Wise, June 2006)
- 06-04** Ethics and International Debt: A View from Feminist Economics (Julie A. Nelson, August 2006)
- 06-05** Can Climate Change Save Lives? (Frank Ackerman and Elizabeth Stanton, September 2006)
- 06-06** European Chemical Policy and the United States: The Impacts of REACH (Frank Ackerman, Elizabeth Stanton and Rachel Massey, September 2006)
- 06-07** The Economics of Inaction on Climate Change: A Sensitivity Analysis (Frank Ackerman and Ian J. Finlayson, October 2006)
- 07-01** Policy Space for Mexican Maize: Protecting Agro-biodiversity by Promoting Rural Livelihoods (Timothy A. Wise, February 2007)
- 07-02** Declining Poverty in Latin America? A Critical Analysis of New Estimates by International Institutions (Ann Helwege and Melissa B.L. Birch, September 2007)
- 07-03** Economists, Value Judgments, and Climate Change: A View From Feminist Economics (Julie A. Nelson, October 2007)
- 07-04** Living High on the Hog: Factory Farms, Federal Policy, and the Structural Transformation of Swine Production (Elanor Starmer and Timothy A. Wise, December 2007)
- 07-05** The Politics of Patents and Drugs in Brazil and Mexico: The Industrial Bases of Health Activism (Ken Shadlen, December 2007)
- 08-01** An Overview of Climate Change: What does it mean for our way of life? What is the best future we can hope for? (Neva Goodwin, March 2008)
- 08-02** Ecological Macroeconomics: Consumption, Investment, and Climate Change (Jonathan Harris, July 2008)
- 08-03** Policies for Funding a Response to Climate Change (Brian Roach, July 2008)
- 09-01** Resources, Rules and International Political Economy: The Politics of Development in the WTO (Kenneth C. Shadlen, January 2009)
- 09-02** Reforming and Reinforcing the Revolution: The Post-TRIPS Politics of Patents in Latin America (Kenneth C. Shadlen, April 2009)
- 09-03** Economic Writing on the Pressing Problems of the Day: The Roles of Moral Intuition and Methodological Confusion (Julie A. Nelson, April 2009)
- 09-04** Sociology, Economics, and Gender: Can Knowledge of the Past Contribute to a Better Future? (Julie A. Nelson, August 2008)
- 09-05** The Environmental Impacts of Soybean Expansion and Infrastructure Development in Brazil's Amazon Basin (Maria del Carmen Vera-Diaz, Robert K. Kaufmann, and Daniel C. Nepstad, May 2009)
- 09-06** Between a Rock and a Soft Place: Ecological and Feminist Economics in Policy Debates (Julie A. Nelson, June 2009)
- 09-07** Getting Past "Rational Man/Emotional Woman": How Far Have Research Programs in Happiness and Interpersonal Relations Progressed? (Julie A. Nelson, June 2009)
- 09-08** Agricultural Dumping Under NAFTA: Estimating the Costs of U.S. Agricultural Policies to Mexican Producers (Timothy A. Wise, December 2009)
- 10-01** Climate-Resilient Industrial Development Paths: Design Principles and Alternative Models (Lyuba Zarsky, February 2010).

- 10-02** Care Ethics and Markets: A View from Feminist Economics (Julie A. Nelson, May 2010)
- 10-03** The Relational Economy: A Buddhist and Feminist Analysis (Julie A. Nelson, May 2010)
- 10-04** Buyer Power in U.S. Hog Markets: A Critical Review of the Literature (Timothy A. Wise and Sarah E. Trist, August 2010)
- 10-05** The Macroeconomics of Development without Throughput Growth (Jonathan Harris, September 2010)
- 10-06** Does Profit-Seeking Rule Out Love? Evidence (or Not) from Economics and Law (Julie A. Nelson, September 2010)
- 11-01** Investment Treaty Arbitration and Developing Countries: A Re-Appraisal (Kevin P. Gallagher and Elen Shrestha, May 2011)
- 11-02** Ethics and the Economist: What Climate Change Demands of Us (J. A. Nelson, May 2011)