Environment and Planning A 2003, volume 35, pages 951 – 957

DOI:10.1068/a3506com

Commentaries

Environmental perceptions and environmental reality: when more is less?

Introduction: environmental paradox?

There is increasing recognition of an apparent paradox with respect to certain dimensions of environmental quality. Some measures of environmental quality, with US air quality being the focus here, have clearly improved over time. However, at the same time that this improvement has occurred, surveys of individuals indicate that they believe that air quality is not improving, but rather is worsening.[1] Although the specific case of US air quality is emphasized here, the paradox is more general—many people throughout the developed world believe that specific, measurable dimensions of environmental quality are deteriorating when the facts argue otherwise. The public policy implications of this will be seen, however, to be far from clear.

Tech Environmental, Inc. (1999) reviewed publicly available data on energy consumption and emissions and determined that there had been, from 1970 to 1997, a 77 million tons per year reduction in the six Environmental Protection Agency (EPA) criteria pollutants; in percentage terms, this represented a 34% reduction over the period.[2]

However, in September 1999, International Communications Research (ICR, 1999) conducted a large poll in which it was found that Americans typically think that air quality has worsened over the past decade.[3] Faced with the specific question, "Do you believe the nation's air has gotten better or worse in the last ten years?" 61% reported "worse", 13% reported "about the same", and only 22% of respondents felt the air to be "better", Moreover, most of the respondents indicated that air quality was worse from their "own personal experiences".

Possible explanations for the paradox

The FCAP site definitely gives the impression that Americans are misinformed, or at least uninformed, in their perceptions. It is possible, for example, that a biased, pro-environment media is consciously or unconsciously misinforming Americans, perhaps by focusing on 'bad news', which might sell better than good news in the competitive media marketplace. There is a common presumption that what we see in our newspapers, magazines, and in popular books (with titles like *Silent Spring*, *Laying Waste*, *America the Poisoned*, *Currents of Death*, and the like) represents a biased perspective.

Also environmental groups may deliberately misinform their constituents. Environmental groups are, indeed, businesses like any other and revenue might be easier to generate by focusing on degradation rather than progress. Additionally, scientists investigating air quality issues (atmospheric modelers, epidemiologists, biologists, and

[1] Indeed, the Foundation for Clean Air Progress (FCAP) has as its mission educating Americans about the progress already made and likely to occur in the future.
See http://www.cleanairprogress.org/index.asp.

[2] The EPA puts the progress over this period at 29% (see http://www.epa.gov/oar/aqtrnd00/).

[3] Although progress in the period 1989 – 99 might differ negatively from that reported for the entire period 1970 – 97, that is not the case; improvements in emissions and even more dramatic environmental quality improvements occurred in the recent period (for more details see http://www.epa.gov/oar/aqtrnd00/).

so on) are themselves hardly disinterested observers with regard to the disbursement of funds for scientific research; biasing perceptions of air quality might be thought to be in their interest.

Further, the tone of the environmental debate continues to be that environmental quality generally, and perhaps air quality specifically, is a moral struggle between the greens and the polluters—between the good guys and the bad guys. It is possible that employing polarizing ad hominem tactics has resulted in generalized disdain for polluters that spills over into air quality perceptions that are very resistant to change, regardless of the 'facts'.

Yet, there are counterarguments. Many books and articles have documented specific and general environmental improvements, with Bjorn Lomborg's *The Skeptical Environmentalist* (2001) being given considerable recent press coverage.[4] And, as already noted, the polled respondents' most commonly cited reason for feeling that air quality is getting worse in the USA is that this perception stems from their "own personal experiences". Might more be going on?

A proposed economic explanation

A resolution of the paradox may lie in a growing gap between the levels of air quality that people desire and the levels they receive, *despite* growth in the latter. There are many reasons why the psychological perception of 'more being less' could arise.

A first consideration involves the noninstantaneous nature of changed desires, changed reality, and changed perceptions. That is, there might be a *lag* in perceptions of cleanup relative to the cleanup that has actually occurred. However, although it is possible that improving US air quality measures are perceived with a lag, it is difficult to see how unperceived air quality improvement could be perceived as deterioration.

There are, though, compelling economic arguments that there has been a failure to regulate as strictly, over time, as is desired by the American public. First, considering traditional economic variables, air quality is a normal good and GDP per capita rose dramatically over the twenty-seven-year period from 1970 to 1997. In 1970 the chained 1996-dollar GDP per capita and disposable personal income were \$17 446 and \$12 823 respectively, rising to \$29 915 and \$21 464 by 1997. Hence GDP per capita and disposable personal income have risen 71.5% and 67.4% over the period 1970–97. Taking the income elasticity of demand for air quality to be unity over this range of income,[5] implies that the 34% increase in air quality supplied over this period is about half of what would have been demanded, holding price constant.

Second, substantial advances in technology have lowered the price of air quality provision over the thirty-year period. Of particular note are the advances in pollution-monitoring technology that have rendered policy approaches involving economic incentives feasible. It is widely recognized that employing economic incentives (pollution taxes, salable emissions rights, and so on) offers substantial efficiency savings in the order of 50% or more. A price reduction of this magnitude would also increase the desire of rational people for greater levels of air quality. Combining price changes due to technological advance with the greater demands due to income growth over the period, it is easy to see how people might feel that 'more is less'.

[4] Lomborg's arguments have received extensive coverage, both somewhat positive (in a discussion in *The Economist* on 2 February 2002) and very negative (in, for example, *Nature*, *Science*, and *Scientific American*).

[5] Because income must be allocated to *some* expenditure, the best-guess income elasticity, in an uncertain world, is 1, though McFadden and Leonard (1993) argue that environmental quality is a superior good.

There is an additional argument, discussed extensively elsewhere (see Flores and Graves, 2002; Graves, 2003). Briefly, suppose that air quality were to grow in optimal apparent relation to income growth and to price reductions, so that aggregated individual marginal willingness to pay equaled marginal cost of provision. It turns out that the demands for air quality would still be understated.

The reason for this is that we generate income to buy the goods that we want. But, if generating income does not allow individuals to purchase the kinds of goods they want, rational people will not generate as much income as they would otherwise. Because air quality is determined collectively, individuals will undergenerate income with which to 'buy' it.[6] The anomalous result is that those caring most for air quality relative to other goods would generate the least income; hence would look like they cared least! We are unable to equate the marginal values of all of the goods we care about (ordinary goods, environmental goods, and leisure); the marginal value of air quality is understated in the economists' traditional approaches to valuation.

The preceding argument supplements the traditional arguments that the *level* of air quality being provided is too low, but to explain the paradox, there would need to be *growth* in the extent to which income is undergenerated. But this is exactly what is to be expected. At some point in the past, the marginal willingness to pay for air quality and other environmental improvements will have been zero or very low, as in very poor countries today. Because only private goods would be demanded, there would initially be no input market failure to generate the proper income levels. But, as income grows, the marginal values of air quality would be expected to grow as well; hence there will be a growing amount of 'ungenerated' income.

The preceding arguments, taken together, suggest that, despite having made limited progress in improving air quality, it is still the case that 'more feels like less'.[7] The marginal rate of substitution between ordinary goods and air quality has grown dramatically over the past three decades, with high and growing marginal values for air quality relative to the low marginal values of ordinary goods that we possess in increasing abundance.

Summary and public policy implications

A rationale is provided here, that does not require ignorance or misinformation, for the observation that US air quality is perceived as getting worse despite documented improvements. The rationale partly involves traditional income and price effects, either of which might be separately sufficient to account for the phenomenon under investigation, possibly operating via a regulatory lag (or a regulatory failure, for example, because of special interest power).

Moreover, we fail to generate optimal incomes when doing so does not enable us to acquire more of the goods we want. Because air quality is determined collectively via various regulations, the traditional approach—based on a *given* income—will result in underproduction that grows over time.

[6] This assumes, for simplicity, independence of air quality from ordinary goods and leisure in the utility function. If there are private good substitutes, even fairly poor substitutes, income will be generated to purchase them (see Graves, 2002).

[7] One might envision a supply-and-demand graph of air quality showing as a vertical line an initial 1970 provision of air quality to the left of the 1970 supply-and-demand equilibrium, resulting in a welfare loss of the traditional sort. By 1997 the collectively determined vertical provision will have shifted rightward 34% but both the demand-and-supply curves will have shifted far more, creating an even larger welfare loss. Note that the growing population (205 089 000 in 1970 versus 272 756 000 in 1997) will also increase optimal air quality, as more individuals are present to benefit. However, because the concern here is with individual perceptions, this point is less germane, despite its relevance for public policy (for example, in benefit–cost analysis).

The public policy implications are clear. We are unconstrained when it comes to the purchase of ordinary goods; hence we will purchase more normal goods as our incomes grow, and more of goods with falling prices. Were we to be politically constrained in our consumption of an important class of ordinary goods to growth levels below those we would have freely chosen, we would feel similarly frustrated.

The application in the present commentary concerns a fairly narrowly defined measure of US air quality. But, the mode of thinking here relates to more general environmental and resource concerns. In considering alternative futures, people tend to be either 'doomsters' (for example, Paul Brodeur, Paul Ehrlich, Norman Myers, Ralph Nader, The Club of Rome, Malthus) or 'boomsters' (for example, Herman Kahn, Bjorn Lomborg, Julian Simon, Elizabeth Whelan). The first group believes that growth in income and population results in ultimately inevitable declines in environmental quality and in resource stocks for the future. The second group feels that growing income increases the demand for environmental quality, while growing population provides both the minds and the labor supply to solve environmental and resource problems as they emerge. As both positions are extreme, the more relevant question would seem to be whether the environment is characterized as being 'one step forward, two steps back' or 'two steps forward, one step back'.

I argue here that the environment could be moving 'two steps forward, one step back' when we very much want it to be moving three or four steps forward for every misstep. The arguments here provide a reasonable explanation for the widespread popularity of the doomster position, despite a lengthy history of faulty predictions of mass starvation, environmental collapse, and resource depletion. We may very well be doing 'better' in absolute terms, but worse *relative* to what we want—and relative values are (and always have been) what matter in the economics of public policy.

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Social science, public policy, and the search for happiness

> "I should say that happiness is being where one is and not wanting to be somewhere else."
>
> Michael Frayn *A Landing on the Sun* (page 151)

A common caricature of academic social scientists is that they are 'out of touch'. There are at least two aspects to this perceived sense of disconnectedness. One is that academic social scientists inhabit an 'ivory tower', with high walls and a high vantage point that isolate and separate their activities from the everyday lived experiences of 'real people'. The second is that social scientists have become disengaged from the

established structures of policymaking and political decisionmaking. They prefer to critique, or dismiss, from a detached and distant, if principled, position, rather than risking compromising their critical purity by 'dining with the devil' and collaborating with the central state. Over recent years, concern at this latter cleavage among British geographers has prompted a rash of writing on the merits and status of so-called 'grey geographies'—research outputs designed to inform and influence public policy (Dorling and Shaw, 2002; Lee, 2002; Peck, 1999). In such debates, fundamental questions soon emerge about the political role of academic research, the functions of the public intellectual, and the social purpose of universities. In the search for first principles, perhaps a unifying starting point could be the aim of maximising well-being—to make life as happy as possible for as many people as possible for as much of the time as possible? Not, of course, unproblematic, but there are worse places to start.

In the United Kingdom, a fascinating government report was slipped out quietly over the Christmas period from the Prime Minister's Strategy Unit on what makes people satisfied with their lives (Strategy Unit, 2003). The report examines survey evidence of contentment, investigates international differences, and explores demographic, social, economic, and political factors before reflecting on the policy implications of knowledge on life satisfaction. Although it may, at first sight, be reassuring to know that think tanks at the heart of the British government concern themselves with understanding the well-being and welfare of their population, readers are curiously, and perhaps rather worryingly, reminded at the top of every one of the sixty-four pages of the report that "this is not a statement of government policy"! Even for those with little interest in the United Kingdom, the many international examples and comparisons presented in this report are worth a look. However, the creation of quasi-academic research units such as this within the heart of a government is an interesting development that is also worth closer examination.

The creation of research units and think tanks within national and subnational governments both to synthesise and to summarise what is largely academic work is not new. In the United Kingdom, the Strategy Unit was, until June 2002, known as the Performance and Innovation Unit (PIU). The PIU was created in late 1998 as part of a package of reforms aimed at strengthening the centre of government following the election of New Labour. The SU/PIU provides additional, research-project-based capacity for the Prime Minister's Policy Unit, based in 10 Downing Street, taking a longer term perspective in its analytical work, to complement the more short-term 'fire-fighting' role that tends to occupy the Policy Unit. A forerunner of this model was the Central Policy Review Staff, established by the then Prime Minister Edward Health in 1971 to advise the Cabinet on strategic policy issues (Blackstone and Plowden, 1990).

The PIU's aim has been "to improve the capacity of Government to address strategic, cross-cutting issues and promote innovation in the development of policy and the delivery of the Government's objectives" (PIU, 1999a, page 132), and it quickly became cast as being in the vanguard of efforts to improve 'joined-up government'. The unit reports directly to the Prime Minister, through the Cabinet Secretary, is primarily project based in its work, and includes a small central team that helps draw up project proposals, manage the unit's workload, and follow up project recommendations. Projects are carried out by small teams, usually of between four and eight people, including members of the central team and secondees from across government departments and from beyond, including academia. The issues that this unit has concentrated on are often intriguingly of international as well as national importance.

The first set of PIU projects was announced by the Prime Minister, Tony Blair, in December 1998.[1] These dealt with the development of e-commerce (PIU, 1999b), the ageing society (PIU, 2000a), the workings of central government in the regions and local areas (PIU, 2000b), managing cross-cutting issues in Whitehall (PIU, 2000c), and rural economies (PIU, 1999a). The programme of work therefore resonates strongly with many of the concerns of contemporary social science. Indeed, since this first wave of projects, the PIU/SU has gone on to review the social, health, and environmental implications of trade liberalisation (PIU, 2000d), the future of UK energy supplies and markets (PIU, 2002), and the policy implications of geographical mobility. It can be argued that these detailed reports provide a far more concise and readable summary of major academic thinking in these areas than the material produced by academics themselves; albeit with a political or policy agenda lying just beneath the surface of each report.

The study of life satisfaction is revealing in several respects. The work of one academic and his colleagues—Professor Andrew Oswald of the Department of Economics at the University of Warwick—has an important influence upon the report. His current dominance of the field, and talents in disseminating his findings (see http://www.andrewoswald.com), coupled with government's increasing preference for the quantification of research findings result, for instance, in the value of a presumably happy marriage being reported as equivalent to a rise in income of £72 000 per annum. The conundrum that, although more wealth tends to bring greater happiness individually, happiness has not risen in general as nations become wealthier, is partly explained by the detrimental effect of income inequalities on happiness. This at least is the case within Europe. Americans appear, according to the report, to manage to achieve similar levels of life satisfaction to Europeans despite greater inequalities. Perhaps they have become acclimatised to this or their greater overall wealth, power, and social segregation militate against the problems of inequality in the most unequal of nations?

International comparisons of life satisfaction reveal that, while in Britain levels are high and relatively stable, similar measures of satisfaction have risen markedly in Denmark over the last three decades, but have fallen dramatically in Belgium. Alternative indices of national well-being are detailed in the report, ranging from those that adopt a traditional gross national product algebra but incorporate environmental factors, to "genuine progress indicators" that value leisure time and other nonmonetary factors, to "social progress indexes" that rather alarmingly include rises in the percentage of the population sharing the same mother tongue, religious beliefs, and racial origins as positive trends (Strategy Unit, 2003, page 57). No comment was made in the report on the value of such socially contentious indices, which presumably represents naivety and oversight rather than any tacit sympathy with such measures. However, the report also illustrates that, when simple quantitative approaches are followed, the gross maximisation of human happiness often implies policies that are likely to work to the detriment of minorities. Being tough on 'criminals', 'asylum seekers', the 'work-shy', and so on may serve to make a large number of other people temporarily feel slightly better.

Questions of human happiness and life satisfaction often implicitly inform social science, but are rarely made explicit. In particular, the darker side of happiness—taking solace in others' misfortune—is rarely studied. The happiness that is derived from living in a large house, having a permanent job, or even a stable relationship may be partly a product of knowing how many others lack such benefits. A similar argument could be made for the less tangible aspects of happiness highlighted in the report.

[1] *Hansard Commons Debates* 10 December 1998, column 277.

For instance, to what degree are people with particular religious beliefs happier than average because they perceive people without their beliefs as lacking something? Much is said about the politics of envy, but very little on the politics of avarice.

The Strategy Unit's report ends with a series of policy implications, divided into three categories: those the authors see as noncontroversial, controversial, and more controversial. Among the first group are subsidising relationships (from funding volunteering schemes to marriage counselling) and improving the welfare state, education, and government information. Among the middle group are suggestions to include happiness measures in cost – benefit analyses; to increase democratic involvement through referenda; and to reduce the corruption of government. Among the apparently most controversial group of policy options to maximise happiness are prioritising the welfare of poorer nations; protecting individuals from risk; increasing progressive taxation; increasing leisure time; and reducing the consumption of positional goods (such as luxury cars). What is perhaps most telling about the report and the Strategy Unit's thinking is the threefold categorisation of these policy options. The assumption is that government would rather see that we became happier through the modification of our personal views and social relationships than to address the social inequalities that are the seeds of much current unhappiness through, for example, progressive taxation. Considering the question of education, on this—according to their categorisation—uncontroversial issue, the report suggests:

> "Young people—and adults—can be given information and guidance about the factors that drive life satisfaction. Going one step further, mutual respect, cooperative behaviour and volunteering can be encouraged, while deceit, greed and envy could be actively discouraged" (Strategy Unit, 2003, page 37).

Be cheerful, strive to be happy, but don't worry too much about the thorny and controversial issues of the poorest nations of the world, about inequalities within national societies or between peoples internationally, or about who should be paying more tax. Perhaps the Strategy Unit's report requires more airtime and considered responses than it has thus far attracted.

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