

# ELR

## NEWS & ANALYSIS

### Individual and Household Environmental Behavior: What Does Economics Contribute to the Discussion?

by Mark A. Cohen

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*Editors' Summary: This Article looks at the issue of individuals and their impact on the environment from an economist's perspective. Prof. Mark Cohen reviews the underlying economic theory of individual behavior as it relates to environmental issues and examines two categories of consumer environmental behavior: individual and household behavior in response to government activities, and consumer purchase behavior in response to product marketing and advertising campaigns. He finds that rational, utility-maximizing individuals might find it in their own interest to take actions that protect the environment—even if they do not personally receive the full benefits of that environmental improvement.*

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#### I. Introduction

The theoretical and empirical contributions of economics are helpful in understanding the role of individual behavior in protecting the environment. While the field of “economics” has become so interdisciplinary over the past few decades, there are some key assumptions and frameworks that economists use that distinguish themselves from other disciplines. First and foremost is the notion that individuals are rational and seek to maximize their utility, however broadly defined. Refinements on the basic utility maximization model that incorporate lack of information, cognitive limitations, and other behavioral outcomes are often mixed and matched with theories developed by other disciplines such as psychology, sociology, and social psychology. Thus, even if the terminology differs, many of the concepts found in the economics literature on individual behavior will look similar to those in other disciplines. What matters most is not the discipline base but the ability of the theory to predict actual behavior.

As Prof. Daniel Farber points out in this issue, individuals have various roles in protecting the environment.<sup>1</sup> Not only are they direct consumers and users of products and services

that might harm the environment, but they might also become involved in community or environmental groups that pressure firms and/or the government to change laws or firm behavior.<sup>2</sup> Furthermore, firms are nothing more than contractual arrangements between owners, managers, and employees—all of whom are themselves individuals. Individual behavior within a firm will likely have a large impact on whether or not a firm complies with existing regulations or whether it goes “beyond compliance.”<sup>3</sup> Thus, for example, if social norms affect individual environmental behavior they are also likely to have an effect on governments, legal institutions, and firms.

This Article focuses primarily on the first type of individual behavior—the direct purchase and consumption of goods and services. However, a more comprehensive analysis might consider the interaction between all of the institutions that individuals are members of and/or influence through their political activities. Part II reviews the theoretical literature on consumer behavior and environmental protection. It is a relatively simple overview that spares the reader the complex mathematical derivations often found in

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1. Daniel A. Farber, *Controlling Pollution by Individuals and Other Dispersed Sources*, 35 ELR 10745 (Nov. 2005).

2. For evidence that firm environmental behavior may be affected by the provision of information to the public, see Shameek Konar & Mark A. Cohen, *Information as Regulation: The Effect of Community Right-To-Know Laws on Toxic Emissions*, 32 J. ENVTL. ECON. & MGMT. 109 (1997), and John W. Maxwell et al., *Self-Regulation and Social Welfare: The Political Economy of Corporate Environmentalism*, 43 J. L. & ECON. 583 (2000).

3. See Mark A. Cohen, *Monitoring and Enforcement of Environmental Policy*, in TOM TIETENBERG & HENK FOLMER, INTERNATIONAL YEARBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 1999/2000 (2000), for evidence on the role of individual behavior on firm compliance behavior. See also Kathleen Segerson & Tom Tietenberg, *The Structure of Penalties in Environmental Enforcement: An Economic Analysis*, 23 J. ENVTL. ECON. & MGMT. 179 (1992).

an economics journal! Part III reviews the role of economics and social norms in explaining individual behavior. Part IV discusses the costs and benefits of alternative policies designed to affect behavior. Part V reviews the empirical evidence on individual environmental behavior. Concluding remarks are reserved for Part VI.

## II. Economic Theory of Consumer Behavior and Environmental Protection

Economics is the study of the allocation of scarce resources. One of the fundamental assumptions of economics is that consumers act rationally and in their own self-interest. This is formalized in the concept of “utility maximization,” where consumers choose the allocation of goods and services that maximizes their own utility subject to their scarce resources. Traditionally, this is written as:

$$\text{Max } U(X, Y), \text{ subject to } P_x \cdot X + P_y \cdot Y = W$$

where:  $U$  is the utility function;  
 $X$  and  $Y$  are goods/services;  
 $P_x$  and  $P_y$  are their respective prices; and  
 $W$  is the consumer’s wealth.

Thus, depending on prices and wealth constraint, the consumer will choose the combination of  $X$  and  $Y$  that maximizes her utility. This simple notion of utility maximization provides a framework in which economists can analyze and predict consumer behavior. Thus, we predict that when the price of good  $X$  increases and the consumer’s wealth is unchanged, she will buy less of that good. Depending on what other goods and services are available in the marketplace and her individual utility function, she might also shift her consumption away from good  $X$  into other goods. While we might not be able to predict the behavior of any one consumer, historical data on prices and consumption patterns will provide predictions of aggregate changes in consumption. Note that it is also common to include an argument in the utility function for “leisure” and a constraint based on the number of hours in the day and hours worked. This explicitly incorporates the fact that individuals often have choices about the number of hours they work (or even if they decide to work two jobs or not at all) and trade this off for leisure time, which is also valued.

Years ago, economists realized that the traditional notion of “goods and services” is too narrow and that in reality, anything that consumers “value” is a part of the utility function. “Utility” is nothing more than an economist’s jargon to represent the personal satisfaction one receives from various pecuniary and nonpecuniary pleasures in life. One example given above is the fact that individuals value leisure time. However, we know that individuals also value “giving to others,” being part of a community, and other activities that social norms dictate. Thus, while economists assume individuals are “self-interested” that does not necessarily mean they are “selfish.”

One way to formalize this notion is to include the utility of other individuals in the utility function.<sup>4</sup> Consider, for ex-

ample, giving to charity. We can write the individual’s utility function as:

$$U = U(x, Y, g)$$

where:  $x$  is a set of consumption goods;  
 $Y$  is the amount of charity contributed by the entire community; and  
 $g$  is the “warm glow” associated with the individual’s giving of charity.

Thus, the individual cares not only about the fact that charity is provided, but also about how much she herself contributes. If there were no “warm glow” from giving charity, the individual would prefer to keep all of the consumption goods for herself and let others give charity instead, i.e., she would completely free ride. Instead, she is willing to give up some personal consumption for the good feeling of giving charity. One of the insights gained from this analysis is that charitable or other “public” behavior is not necessarily related to income or wealth. That is, it is possible that individuals who are less wealthy will have a strong preference for giving to others or to the “public good.”

This simple model suggests that individuals will ignore any “external” effects their consumption will have on third parties. Thus, the fact that commuting to work by car causes environmental harm is not factored into this equation and does not affect the consumer’s choice of whether to drive or take public transportation. One implication of this model is that if there is an externality from driving, for example, the government could impose a tax on gasoline or parking, tolls on roads, etc., so that the price of driving to work is higher to account for the external effect of pollution that is not otherwise considered by the consumer. If the additional tax is equal to the marginal social harm caused by the driving behavior, this will cause the consumer to fully “internalize” this externality and choose the socially optimal level of driving behavior. While here this is characterized as a “tax,” it might also be a fine. For example, if the government were to outlaw dumping of used oil in the sewer, it could impose a “fine” on used oil dumping. Alternatively, it could subsidize the correct disposal of used oil by imposing an upfront deposit on motor oil and a return payment upon properly disposing at a collection site.

Of course, taxing socially harmful behavior is not the only way to reduce social harm. One option is to regulate, e.g., prohibit driving in a downtown area certain days, and impose penalties when that regulation is violated. Another option is to subsidize more desirable behavior, e.g., high-occupancy vehicle (HOV) lanes or public subsidies for mass transit. Which one (or combination) of these approaches should be used depends on many economic and political factors but clearly involves decisions about the costs and benefits of each solution.<sup>5</sup>

4. This formulation is taken from James Andreoni, *Giving With Impure Altruism: Applications to Charity and Ricardian Equivalence*, 97 J. POL. ECON. 1447 (1989). See also Gary Becker, *A Theory of Social Interaction*, 82 J. POL. ECON. 1063 (1974).

5. There is an extensive literature on the costs and benefits as well as the political feasibility of implementing environmental policy instruments such as taxes, subsidies, marketable permits, etc. The literature is voluminous and beyond the scope of this Article. The most accessible way to review this literature is to read one of the many environmental economics textbooks. See, e.g., CLIFFORD S. RUSSELL, *APPLYING ECONOMICS TO THE ENVIRONMENT* (2001). Throughout this Article, I have ignored the option of using property rights to solve this externality problem. The well-known Coase Theorem, for example, tells us that in the absence of transactions costs, when one party imposes an externality on another, assigning property rights to either party will ultimately result in an efficient outcome as the two

Beyond legal restrictions and monetary incentives, there are various constraints on individual behavior that might inhibit environmentally harmful behavior. These constraints might include both formal and informal sanctions by institutions such as religious organizations, family or peer pressure, co-workers, or other organizations that an individual belongs to.

Another approach that provides further complexity and richness on the altruism model examines the case where the consumption of one good creates an externality, e.g., pollution.<sup>6</sup> Here, we can specify an "altruistic" utility function as:

Utility ( $x, z, Z, U$ )

where:  $x$  is a set of consumption "goods" that produces no external harm;  
 $z$  is a "good" that does produce external harm, e.g., pollution;  
 $Z$  is the collective amount of this external harm in society; and  
 $U$  is the utility of all others in the community (aside from the individual).

This approach acknowledges the fact that when deciding whether or not to purchase a "polluting" good, a consumer might take into consideration the effect that this additional pollution will have on the total pollution in the community as well as the well-being of other members of society. The extent to which this will affect the consumer's choices will then depend both upon "altruistic preferences" as well as the individual's endowment. Thus, the individual will trade off individual consumption for "public" consumption based on the marginal utility she receives from each good.

One problematic implication of these models, however, is that the individual's level of giving (or environmentally friendly behavior) is likely to be negatively correlated with how much others in society are giving. Since utility partly depends on the well-being of others, as others give more, there is less need to give yourself. This is a classic free riding problem. Thus, an individual may gain utility from being altruistic simply because this provides her with a warm glow or "self-respect." On the other hand, an individual may gain utility because her stature within the community is now enhanced by having a reputation for caring or otherwise being a good citizen. Thus, individuals might value a combination of self-respect and external reputation. A more complex utility maximization problem that takes into account both self-respect and reputation might be written as follows<sup>7</sup>:

parties will bargain amongst themselves and the "least-cost avoider" will ultimately reduce or avoid the externality. See Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1 (1960). In this Article, however, we are dealing primarily with the behavior of thousands of individuals—or reducing the impact of pollution on large segments of the population. In either case, the transactions costs associated with organizing such a large number of people makes it unlikely that a property rights approach will work.

6. This approach is taken from Olof Johansson, *Optimal Pigovian Taxes Under Altruism*, 73 LAND ECON. 23 (1997).

7. This formulation is adapted from Mark A. Cohen & Sally S. Simpson, *The Origins of Corporate Criminality: Rational Individual and Organizational Actors*, in *DEBATING CORPORATE CRIME* ch. 2 (William S. Lofquist et al. eds., 1997). For a detailed discussion of how to incorporate moral behavior into the standard economic model, see Robert S. Goldfarb & William Griffith, *Amending the Economist's Rational Egoist Model to Include Moral Values and Norms Part 1: The Problem, and Part 2: Alternative Solutions*, in *SOCIAL NORMS AND ECONOMIC INSTITUTIONS* (Kenneth J. Koford

Maximize Expected Utility (Income,<sup>8</sup> Quality of Life, Reputation, Self-Respect)

subject to: Income =  $f^9$  (wage rate, hours of work, probability and severity of fine if the law is broken);

Quality of Life =  $f$  (value of time, hours of work, value of freedom, probability and severity of prison sentence and expected incarceration time if crime is committed);

Reputation =  $f$  (existing reputation, expected change in reputation if community or family determines behavior is unacceptable or exemplary); and

Self-Respect =  $f$  (existing self-respect, change in self-respect if behavior is considered unacceptable or exemplary).

Note that while few environmental offenses actually lead to prison, the risk is real in some instances and thus has been included in the general model shown above. For example, in the mid-1980s there were a series of high-profile federal prosecutions of individual homeowners who filled in wetlands or killed birds.<sup>10</sup> Even if not widely used, the "signal" that an offense carries with it a threat of prison might be a powerful factor in shaping social norms.<sup>11</sup>

The above model explicitly separates out "reputation" and "self-respect." Reputation is outwardly focused on how others, e.g., family or community, view an individual,<sup>12</sup> while self-respect (often referred to as "warm glow" by economists) is inwardly focused on the individual's view of herself. The extent to which an individual cares about one or both of these factors is highly idiosyncratic. It is akin to the question of why some people like red and others like blue—which includes such potential culprits as genetics, family upbringing, peer pressure, social norms, etc. Economics can help analyze individual behavior given these particular preferences. However, economics might also assist us in understanding why these factors themselves exist and how they can be influenced by policymakers.

Given the above scenario, why do some people dispose of products in an environmentally friendly manner while others pour used motor oil in a sewer? Starting from the most simplistic assumption that individuals are fully informed and rational, they will weigh the expected benefits from ille-

& Jeffrey B. Miller eds., 1991), and Mark A. Cohen, *Norms Versus Law: Economic Theory and the Choice of Social Institutions*, in the same volume.

8. Note that while the earlier utility function explicitly includes "goods and services" instead of money income, there is no fundamental difference between these two approaches. While "income" itself is not generally considered an argument in the utility function, it stands here as a proxy for the goods and services it can buy.
9. The letter "f" refers to "function." Thus, in this equation income equals a function of wage rate, hours of work, etc.
10. See Mark A. Cohen, *Environmental Crime and Punishment: Legal/Economic Theory and Empirical Evidence on Enforcement of Federal Environmental Statutes*, 82 J. CRIM. L. & CRIMINOLOGY 1054 (1992).
11. See Kenneth G. Dau-Schmidt, *An Economic Analysis of the Criminal Law as a Preference-Shaping Policy*, 1990 DUKE L.J. 1 (1990).
12. In a game theory context, this reputation argument is often considered a form of "reciprocity." See, e.g., Robert Sugden, *Reciprocity: The Supply of Public Goods Through Contributions*, 54 J. PUB. ECON. 185 (1984).

gally disposing of used motor oil against the expected costs. The expected costs of illegal disposal might include formal sanctions (probability of detection, severity of punishment, etc.), informal sanctions or “psychic” costs to the individual (lack of self-respect, loss of reputation, etc.), and the opportunity cost of the time required to dispose of the oil. The expected benefits of illegal waste oil disposal are increased income from not having to pay a disposal fee, travel costs, and more leisure time if legal disposal requires longer travel time, etc. Thus, environmental behavior is the result of individual decisions made in the face of various opportunities and constraints.

Although the general utility maximizing model applies to all individuals, not every person will act alike even if they face the same external constraints. Some people have more moral inhibitions than others; some are extremely averse to being punished or looked down upon by their neighbors or peers. Put differently, individuals may place different weights on the various arguments in their utility functions. Some individuals may place virtually zero weight on moral inhibitions (and thus be likely to act in a manner that hurts the environment if it appeared in their personal self-interest), while others place a very high weight on that factor. Similarly, the constraints identified above may be more or less binding for different individuals. Individuals will differ in their current job status, their economic status, stature within the community, etc. For example, individuals with little reputation in the community may find this constraint less binding; they have little reputation to lose if they are caught dumping used motor oil into a sewer, and thus the “cost” to them in lost reputation is very small. Those with extremely high reputations in the community will have a lot to lose and thus pay an extremely high price for being detected and/or fined for this unlawful act.<sup>13</sup>

In addition to differences across individuals in terms of the weight they place on morality and reputation, individuals are likely to have differing amounts of information about the costs and benefits of their actions. Thus far, this Article has assumed that the individuals who are making decisions are “fully informed.” However, cognitive limitations and the amount of time required to obtain information make this an unlikely scenario. Thus, if consumers are less than fully aware of the availability of environmentally sound disposal alternatives, for example, they might make disposal decisions that are not only against society’s best interest, but also against their own self-interest and desires if they were fully informed. Similarly, if they are unaware of the environmental harm—or that they might be shunned by their neighbors if they place used motor oil down the sewer—they might not take those factors into consideration when deciding upon their “preferred” disposal method.

### III. Social Norms and Economics

Much has been written by law and economics scholars about the role of social norms in explaining individual behavior. One useful taxonomy of the role of social norms in economics defines three types: “rationality-limiting”; “preference-

changing”; and “equilibrium-selection” norms.<sup>14</sup> The “rationality-limiting norm” is one that reduces the set of alternatives an individual will consider. Thus, in the absence of the norm, an individual might choose option A. However, if that option is ruled out by a social norm as being unacceptable (either for self-respect or reputation reasons), it “is simply not done.” This is largely how the utility maximization problem above was modeled by specifying reputation and self-respect as being constraints on utility. If an option would reduce an individual’s reputation too much, it simply won’t be chosen. This is very similar to a legal prohibition (with accompanying penalties for a violation). An individual who might otherwise prefer the illegal option will weigh the risk of being detected and the expected penalty if detected against the benefits of the illegal activity. Similarly, the individual who otherwise prefers the “immoral” option will weigh the risk of being detected by her family, friends, and neighbors and the expected loss in reputation against the utility value of that option. For such a norm, affecting behavior requires changing the constraints, i.e., changing either the risk of being detected or the reputation loss from choosing the “bad” outcome. In other words, increased social pressures and sanctions for nonconforming behavior will make this constraint more binding.

The second type of norm is called “preference-changing” because it is assumed to literally change the utility function. Thus, a norm might cause an individual to “re-weigh” their utility function away from certain items and toward others. Economists generally believe that it is more difficult to change underlying preferences than it is to change the constraints that individuals face. That does not mean that over time individual preferences cannot be changed. However, it is a lot easier, for example, for a family member to display verbal disapproval of another family member who refuses to recycle than it is to change that individual’s underlying preferences for recycling. Put differently, it might be easier to “shame” someone into recycling than it would be to make them inherently “feel good” about recycling. Over time, however, the person who originally was shamed into recycling might indeed feel good about their behavior and they might derive utility/pleasure from knowing that they are contributing to the common good.

Finally, some norms are considered to be primarily “equilibrium-selection” norms that are primarily used as mechanisms to facilitate coordinated actions that are in the interest of all members of society, e.g., driving on the left side of the road. These norms are less relevant here.

From the above discussion, we can begin to see how economists view social norms. “Rationality-limiting norms” might be thought of as institutional mechanisms that substitute for (or complement) laws, regulations, taxes, fees, etc. To the extent that they are less costly to enforce, they might be preferred to more formal legalistic approaches. Similarly, to the extent that “preference-changing norms” are feasible, they will also provide inexpensive alternatives to government-imposed enforcement mechanisms.

However, the fact that social norms might help economize on government or other enforcement regimes does not necessarily mean they are always a preferred mechanism to induce individual behavior or to reduce the impact of exter-

13. E.g., John R. Lott Jr. *An Attempt at Measuring the Total Monetary Penalty From Drug Convictions: The Importance of an Individual’s Reputation*, 21 J. LEGAL STUDIES 159 (1992) (containing empirical evidence suggesting that higher income individuals convicted of drug offenses have higher losses in subsequent earnings than lower income individuals convicted of drug offenses).

14. Kaushik Basu, *Social Norms and the Law*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW (1998).

nalities. In economics, one always needs to weigh the costs and benefits of alternatives before passing judgment—a topic that is explored in more detail in the next section.<sup>15</sup>

#### IV. Costs and Benefits of Alternative Policies Designed to Affect Behavior

It is one thing to say that an information campaign, label, legal sanction, etc., actually affects individual behavior in any meaningful way. It is another matter, however, to say that these policies are cost effective or socially beneficial. Policy analysts often distinguish studies based on three levels of increasing sophistication: (1) “effectiveness” studies determine whether or not behavior is changed in response to a policy; (2) “cost-effectiveness” studies calculate the cost per unit of success (depending on the metric of interest); and (3) “cost-benefit” studies explicitly measure all social costs and benefits to determine whether or not a proposal’s benefits outweighs its costs.

To illustrate these three concepts, suppose the government decides to spend \$1 million on a public service marketing campaign designed to convince the public to carpool to work. An “effectiveness” study might conduct a survey of the public before and after the information campaign to determine whether or not carpooling has increased as a result. Suppose, for example, that this campaign was estimated to increase carpooling by 500 cars per workday. Then, a “cost-effectiveness” study might note that 500 fewer cars are on the road, 5 days per week, 50 weeks per year. For simplicity, I’ll assume that this program has benefits that only last one year, i.e., there is no long-term change in behavior. This results in 250,000 fewer one-way drives to work per year, or about \$4.00 per trip. If the average trip to work is 5 miles one way, this results in 80 cents per reduced mile driven. This figure might then be compared to other policies that reduce vehicle miles driven to see which policy is more “cost effective.”

Even if the government determines that this public information campaign reduces the largest number of vehicle miles driven for its \$1 million budget, this does not tell us whether or not the policy passes a cost-benefit test and whether the \$1 million should be spent at all. To determine whether or not changing individual behavior is a worthwhile undertaking, a cost-benefit analysis would need to be conducted. In other words, is 80 cents too high a price to pay to reduce a vehicle mile driven? In this example, the real costs of the program appear to be the \$1 million expenditure on advertising. However, there will likely be additional hidden costs such as the value of time devoted by government agency workers or other volunteers who work on the program. In addition, if carpooling requires additional time on the part of one or both of the two commuters who must go out of their way to join the commute, the monetary value of this time should be included as a cost of the program. The

benefits would include: (1) potential savings in gas and wear and tear on vehicles; (2) reduced pollution from fewer vehicle miles driven; and possibly (3) reduced congestion time on the road for all commuters.

As this example illustrates, conducting a cost-benefit analysis is not a simple matter. First, one must be able to quantify any environmental benefits and place monetary values on them.<sup>16</sup> Even then, the task is more complicated than simply comparing the environmental benefits to the direct program costs. One must carefully consider any additional time and expenses that the public now incurs in making the required changes. In addition, a cost-benefit analysis should always consider alternative approaches to see which has the highest benefit and lowest cost. For example, if the problem being addressed is “vehicle miles driven” and its resulting pollution and congestion, there are numerous policies that might be considered and should be judged together—including public transportation, toll/congestion pricing, gasoline taxes, vehicle or parking taxes, use restrictions, vehicle design standards, fuel economy standards, etc. Ultimately, when society is judging alternative policies to reduce the harmful effects of an externality, the “least-cost avoider” should be considered the primary target for intervention.

Finally, any policy option being considered must be analyzed very carefully for the possibility of unintended consequences. In the context of environmental protection, the classic example is the fact that raising the price of hazardous waste disposal in order to encourage the use of less hazardous products, reuse, or recycling of hazardous products might also induce some consumers to illegally dispose of hazardous wastes. While some of this illegal behavior might be an inevitable consequence of the policy, it should be accounted for in conducting a cost-benefit analysis. It is possible that the negative consequences of illegal disposal could outweigh any positive benefits from those who are encouraged to be environmentally responsible. As discussed in the next section, this possibility is not just hypothetical.

Before moving on to the empirical evidence, an important caveat must be raised. Even if society would be better off with less pollution, achieving lower levels of pollution through changing social norms—even if there is no “direct cost” associated with changing those norms—might actually make society worse off. This counterintuitive result is worth exploring as it raises some important insights. Suppose, for example, that the government promotes recycling through an advertising campaign that touts the “good neighbor” aspects of recycling.<sup>17</sup> In terms of individual utility, we can classify all of the expected changes to the representative individual in society resulting from this information campaign as:

- (1) environmental gain due to increased recycling in society (+);
- (2) increased time devoted to recycling, reducing other leisure activities (-); and

15. Despite my claim that economics can accommodate and analyze the role of nonmonetary incentives such as social norms in affecting individual environmental behavior, this approach is still less than mainstream in the environmental economics literature. For example, a recently published book devoted to the “economics of recycling” by Resources for the Future—the leading environmental economics think tank in the United States—has no mention of social norms or nonmonetary incentives as a motivating factor in household recycling behavior. See RICHARD C. PORTER, *THE ECONOMICS OF WASTE* (2002).

16. Economists have numerous methods for placing monetary values on environmental benefits. For a review of this literature, see *HANDBOOK OF ENVIRONMENTAL ECONOMICS* chs. 24-30 (Daniel Bromley ed., 1996).

17. This example and the theoretical insights are taken directly from Annegrete Bruvoll & Karine Nyborg, *The Cold Shiver of Not Giving Enough: On the Social Cost of Recycling Campaigns*, 80 *LAND ECON.* 539, 541-42 (2004).

(3) change in self-respect (and/or reputation) from recycling activities (?).

Thus, while individuals will benefit from the improved environment resulting from their recycling efforts (as well as the recycling efforts of others in society), they will also be harmed to the extent they spend less time on leisure activities while spending time recycling. (There might also be some out-of-pocket cost to the individual if they must drive to a recycling facility, etc.) However, there is a third factor to consider. Individuals who previously did not recycle now lose “self-respect” and are worse off than they were prior to this new information campaign. Of course, they might be induced to improve their self-respect (and/or external reputation) by recycling—which is the goal of the information campaign. However, even if that happens, they have now at best “regained” their self-respect and might not be in any better position than they were before. On the other hand, depending on the value of their leisure time, etc., they might not recycle enough to fully regain their self-respect. Thus, there are several potential outcomes depending on the individual’s preferences, social networks, value of leisure time, and so on.

While the improvement in environmental quality is clearly positive and the reduced leisure time (and potential out-of-pocket costs) from recycling is negative, the change in self-respect is ambiguous. To recap, there are two “norm” effects: (1) the negative self-image effect from the changing social norm that expects more recycling; and (2) the positive self-image effect from the increased recycling behavior. Whether the former outweighs the latter is unclear and thus the net effect of this social norm is ambiguous a priori. To the extent that individual consumer behavior falls short of the new social norm, there is a loss in social welfare. This must be taken into account in judging the social efficacy of a norms-inducing policy.<sup>18</sup>

## V. Empirical Evidence on Consumer Environmental Behavior

The empirical evidence on consumer environmental behavior falls into two broad categories: (1) individual and household behavior in response to government activities; and (2) consumer purchase behavior in response to product marketing and advertising campaigns. In addition, a related area of research revolves around experimental evidence on altruistic and reciprocal behavior. Each will be studied in turn.

### A. Individual and Household Behavior in Response to Government Activities

Local, state, and national policies have been directed toward individual and household behavior in various contexts. In some cases, laws are written and enforced requiring consumers to undertake certain environmentally friendly practices such as recycling of household waste, proper disposal of used motor oil, HOV lanes to encourage carpooling, subsidies for public transport, and information campaigns to encourage individuals to take certain actions. The majority of economic studies of individual environmental behavior focus on recycling laws as this is an issue that has been the subject of policy debates, local and state laws, etc., for a number of years. Not surprisingly, many of the existing studies focus on consumer reaction to price changes. They compare “fixed fee” systems to those where homeowners are charged a “per unit” price for waste disposal, thereby creating an incentive to recycle or reduce wastes.<sup>19</sup>

For example, one study of municipal solid waste disposal practices in nine communities between 1980 and 1989 compared a “fixed fee” to a “per unit” disposal cost approach.<sup>20</sup> Four of these communities had traditional systems whereby residents paid for disposal based on a “fixed fee” through property taxes or an annual waste disposal fee that did not vary by quantity of waste. The other five communities charged residents on a “per unit” basis. It was estimated that switching from a fixed fee to a per unit fee based on the amount of refuse disposed would have a significant effect on solid waste disposal volume. For the typical community, a user charge of \$1.31 per 32-gallon container of waste was estimated to recoup the marginal social cost of waste (estimated to be \$125.00 per ton) and would result in a decrease of waste generation of 20%—about one-half of one pound per person per day.<sup>21</sup> This is a significant amount that could increase the life of landfills, reduce disposal costs, decrease future groundwater contamination, and so on.

Another study compared recycling rates at 58 different municipalities that had mandatory recycling laws with some form of pickup at home.<sup>22</sup> It was hypothesized that higher education level would be associated with greater recycling rates as those individuals would more likely be environmentally conscious. While this result was generally verified in the data, it is at best only evidence that individuals have varied underlying preferences for environmental protection. It does not help us understand how social norms might be used to influence behavior. In fact, the authors in this study—as in many other traditional studies in economics—essentially ignore the possibility that individual preferences might be affected by governmental or other nonprofit actions in this arena. For example, unlike the models discussed in Part II, they simply postulate that individuals are endowed with a preference for “ecological consciousness.” In fact, when

18. Some might argue that society should ignore any loss of self-respect or reputation to those individuals who do not recycle. This is largely a philosophical question that can be argued either way. Economists would generally argue that since “non-recyclers” are members of society, their utility should be included in any measure of aggregate social welfare. This point has been debated in the “economics of crime” literature. For example, in determining what the social costs of crime are, Phillip Cook indicates that he “presumes that the criminal is properly viewed as a member of society.” Phillip J. Cook, *Costs of Crime*, in *ENCYCLOPEDIA OF CRIME AND JUSTICE* (S.H. Kadish ed., 1983). In contrast, William Trumbull argues that those who violate the criminal law are not entitled to have their utility counted in the social welfare function, i.e., their gain or loss is to be ignored. William N. Trumbull, *Who Has Standing in Cost-Benefit Analysis?*, 9 J. POL’Y ANALYSIS & MGMT. 201 (1990). This example highlights the fact that “social welfare” is a normative concept based on a subjective evaluation of whether or not an activity is socially valuable or harmful.

19. For an extensive summary of this literature, see DON FULLERTON & THOMAS C. KINNAMAN, *THE ECONOMICS OF HOUSEHOLD GARBAGE AND RECYCLING BEHAVIOR* (2002).

20. ROBIN R. JENKINS, *THE ECONOMICS OF SOLID WASTE REDUCTION: THE IMPACT OF USER FEES* 9-11 (1993).

21. In economic jargon, the price elasticity of demand was estimated to be -0.12; i.e., a 10% increase in the price of disposal would reduce the quantity of waste by 1.2%.

22. Vijaya G. Duggal et al., *Recycling: An Economic Analysis*, 17 E. ECON. J. 351 (1991).

discussing the problem of recycling, they note that “any large scale recycling program must be government initiated, either through mandatory regulations or economic incentives.”<sup>23</sup> While this might ultimately be true, it ignores the potentially important role that information and social norms might have on behavior.

In addition to these individual studies, a meta analysis was conducted on 67 empirical studies on the determinants of recycling behavior.<sup>24</sup> The authors of this meta analysis conclude that while monetary incentives clearly affect behavior, other factors are also important. In particular, both “knowledge” and “social influence” have significant effects on individual behavior. “Once educated about recycling—for example, the importance and availability of recycling, or how to recycle quickly and conveniently—consumers should easily take to recycling. The social influence of neighbors, friends, and family members can extend the recycling behaviors.”<sup>25</sup> Interestingly, the authors find that demographic characteristics are only “weakly correlated” with recycling behavior.

One study of particular interest to this issue examined the costs and benefits of household recycling in one city and concluded that the household pickup of recycling could not be justified on the basis of direct measurable benefits such as reduced landfill costs.<sup>26</sup> For example, it was estimated that the costs of the recycling effort exceeded the benefits by \$10.35 per household. Yet, the direct benefits ignore potential consumer benefits such as reduced noise, odor, and water contamination from landfills, as well as any other intangible benefits residents feel from recycling. It also ignores the opportunity cost of the added time spent by consumers in sorting their trash. A contingent valuation survey of local residents estimated that on average households were willing to pay \$92.48 per year for this municipal recycling program—a figure that far exceeds the cost to the city.<sup>27</sup>

Several studies have examined the unintended consequences of recycling or waste disposal laws.<sup>28</sup> As discussed in Part II, the concern is that if the price of legal disposal is too high, the government actually encourages illegal disposal. In fact, this phenomenon appears to have been borne out in some cases. For example, one study found that states that implemented a ban on used oil disposal (and instead required used oil to be disposed of in special treatment or recovery facilities) experienced a 28% increase in the number of incidents of illegal used oil dumping relative to states that allowed used oil to be disposed of in traditional landfills.<sup>29</sup> Depending on where the used oil is illegally disposed of, it is

entirely possible that these well-intentioned bans on disposal caused more harm than good. The policy implication of such a situation might be to adopt another approach, such as a deposit/refund system whereby consumers are provided with a rebate upon bringing used oil to the recovery site or some sort of subsidized legal disposal. Of course, another policy option that might also be considered (in place of or in conjunction with subsidized legal disposal) is the use of information campaigns to induce stronger social norms<sup>30</sup> and increased monitoring and enforcement against illegal disposal.<sup>31</sup>

### *B. Consumer Behavior in Response to Environmental Marketing Campaigns*

The academic field of marketing is closely related to both psychology and economics. In fact, academics in the field tend to be trained in either (or both) of these fields. Green marketing began to take hold in the late 1980s and early 1990s, although it was slowed down considerably in the United States following the Federal Trade Commission's issuance of advertising guidelines.<sup>32</sup> That has changed somewhat over time both in the United States and worldwide where green marketing has grown more acceptable and taken on a life of its own through new product innovations, niche marketing, and mainstream environmental certifications and labeling.

In the United States, a series of Roper surveys in the early to mid-1990s (originally sponsored by the S.C. Johnson Company) helped to identify segments of the consumer market that were most receptive to green marketing claims.<sup>33</sup> For example, “True-Blues” represent about 10% of the population and are those who are most politically and socially active on environmental issues. They tend to contribute to environmental causes and refuse to purchase products that are not environmentally friendly. “True-Blue” consumers are the most educated market segment and are more likely to be women living in the South or Midwest. Similarly, “Greenbacks” represent about 5% of the population and are willing to pay extra for environmentally friendly products. However, they believe they are too busy to significantly change their behavior and instead use their pocketbooks. “Greenbacks” are the wealthi-

23. *Id.* at 352.

24. Jacob Hornik et al., *Determinants of Recycling Behavior: A Synthesis of Research Results*, 24 J. SOCIO-ECON. 105 (1995).

25. *Id.* at 122-23.

26. Thomas C. Kinnaman, *Explaining the Growth in Municipal Recycling Programs: The Role of Market and Nonmarket Factors*, 5 PUB. WORKS MGMT. & POL'Y 37 (2000). This article was reprinted in a collection of related studies in FULLERTON & KINNAMAN, *supra* note 19.

27. Kinnaman, *supra* note 26, at 46.

28. See, e.g., A.M. Sullivan, *Policy Options for Toxics Disposal: Laissez-Faire, Subsidization, and Enforcement*, 14 J. ENVTL. ECON. & MGMT. 14, 58-71 (1987); Donald Fullerton & Timothy C. Kinnaman, *Garbage, Recycling, and Illicit Burning Dumping*, 29 J. ENVTL. ECON. & MGMT. 78-91 (1995).

29. Hilary Sigman, *Midnight Dumping: Public Policies and Illegal Disposal of Used Oil*, 29 RAND J. ECON. 157 (1998).

30. See, e.g., Michael P. Vandenbergh, *The Individual as Polluter*, 35 ELR 10723 (Nov. 2005).

31. For a review of the literature on monitoring and enforcement of environmental regulations, see Cohen, *supra* note 3.

32. Guides for the Use of Environmental Marketing Claims, 16 C.F.R. Pt. 260. While the Federal Trade Commission (FTC) guidelines were a natural reaction to questionable advertising claims on the environmental benefits of certain products, it had the negative effect of raising the cost of making any environmental marketing claims. Many of the large consumer product companies essentially eliminated any green marketing in the United States following the FTC guidelines—preferring instead to focus on other product attributes with less risk of negative press and regulatory hassle. For a thorough discussion of the FTC guidelines, see Jeremy Rosen, *Requirements for Environmental Marketing Claims Under the Federal Trade Commission's Guidelines*, 4 ENVTL. L. 241 (1997), and David W. Case, *Legal Considerations in Voluntary Corporate Environmental Reporting*, 30 ELR 10375 (May 2000).

33. The most recent poll in 1996 is cited in JACQUELYN A. OTTMAN, *GREEN MARKETING: OPPORTUNITIES FOR INNOVATION* ch. 2 (1998), available at [http://www.greenmarketing.com/Green\\_Marketing\\_Book/Green\\_Marketing\\_Book.html](http://www.greenmarketing.com/Green_Marketing_Book/Green_Marketing_Book.html) (last visited Aug. 31, 2005).

est of the market segments and tend to be married white males and are more likely to be in white-collar jobs. From the perspective of changing behavior, the most promising segment might be the “Sprouts,” who make up about one-third of the U.S. population:

They are willing to engage in environmental activities from time to time but only when it requires little effort. Thus, recycling, which is curbside in many communities, is their main green activity. They read labels for greenness—although less often than the True-Blues and Greenbacks neighbors. Their greenness ends at the supermarket check-out: even though Sprouts and Greenbacks have similar median incomes, Sprouts generally won’t choose a green product if it is more expensive than others on the shelf. When they do, they are only willing to pay up to 4 percent extra. More than half (56 percent) are female and at 43, they have the highest median age of any of the five groups. Sprouts are distributed evenly across the country. They are well educated, and just under two-thirds of them are married. They comprise the swing group that can go either way on any environmental issue. With more education, they are often the source for new Greenbacks and True-Blues.<sup>34</sup>

Approximately 15% of the U.S. population are considered “Grousers” who believe that individuals play little role in protecting the environment—instead shifting responsibility to the government and corporations. “Often confused and uninformed about environmental problems, 45 percent of Grousers recycle bottles and cans regularly, but grudgingly; they do so to comply with local laws rather than to contribute to a better environment.”<sup>35</sup> Finally, approximately 37% are labeled “Basic Browns” who largely believe that environmental issues are not a serious problem and who are very unlikely to be environmentally conscious in either their purchase or product use behaviors. Members of this group have the lowest median income of any of the five segments, the lowest educational level, and are more likely to live in the South.

Understanding these market segments, their demographics, motivations, etc. might not only help marketing firms design green product advertising campaigns, but also could be used by policymakers to focus their attention in determining who and how to concentrate their limited public service advertising budgets, meeting/organizing efforts, information campaigns, and so on. While it might be nice to try to convince a “Basic Brown” to change their product usage behavior, the same level of effort might have much higher payoff if focused on “Sprouts” or even less-informed “True-Blues” who simply need more accurate information to make wiser decisions in their daily habits. On the other hand, messages targeting segments that are already knowledgeable and/or practicing environmentally friendly behaviors might be a waste of resources as well.

Academic studies by marketing professors as well as actual field experiments by marketers provide some insights into the type of green marketing claims of most interest to consumers.<sup>36</sup> While it is unnecessary to extensively survey

this literature here, a few important highlights are relevant to this Article and issue. First, it is clear that a large segment of the population of consumers claim to have made some purchase decisions and product usage (and disposal) decisions based on environmental considerations. Perhaps more importantly, they are open to education and information about better environmental choices. This was discussed in the Roper poll results above. Second, one can identify “best practices” and marketing approaches that take into account the motivations of these market segments. As one green marketing consultant noted, a successful environmental marketing campaign will include elements of education, appeal to the consumer’s self-interest (oftentimes healthy lifestyles), provide reassurance of product performance/quality, and oftentimes identify itself as “being cool” in a socially acceptable manner.<sup>37</sup>

While the “green marketing” literature provides many useful insights, much of it is based on surveys of consumers and case studies of individual marketing campaigns. There are few systematic and large-scale studies of actual consumer purchase decisions. One exception is in the area of environmental labeling. A recent study of the Nordic Swan—an environmental certification label on consumer products—found that the label had significant effects on Danish consumers’ brand choice for toilet paper, paper towels, and detergents.<sup>38</sup> For example, the authors found that “marginal willingness to pay” for the Nordic Swan label was approximately 13% to 18% of the price of toilet paper. Interestingly, they did not find any consistent patterns where the demand for the environmentally responsible product varied by level of education or income. They did find, however, that males shopping on their own and households with children were less likely to be influenced by the Nordic Swan label.<sup>39</sup>

Another interesting finding from the study of the Nordic Swan label is that there is considerably lower willingness to pay for the environmental label for paper towels (compared to either toilet paper or detergents). The authors attribute this finding to the fact that there is a ready substitute for paper towels—dish towels that are commonly used in Denmark. Thus, the most environmentally conscience consumers were most likely not in the market for paper towels anyway and, hence, the estimated willingness to pay for those consumers who shop for paper towels is lower. This has important implications for any empirical analysis of consumer behavior. It also suggests that those who want to study the effect of information campaigns or other norms-inducing government programs consider whether those who are most likely to be receptive to the campaign are those who are least likely to require behavioral changes.

In a review of existing academic literature, only five previous empirical studies that examine the effect of an environmental label on consumer purchase decisions were found.<sup>40</sup> “In three cases it appears that the presence of the la-

34. *Id.*

35. *Id.*

36. See, e.g., ENVIRONMENTAL MARKETING: STRATEGIES, PRACTICE, THEORY, AND RESEARCH (Michael J. Polonsky & Alma T. Mintu-Wimsatt eds., 1995). See also ENVIRONMENT, INFORMATION, AND CONSUMER BEHAVIOUR (Signe Krarup & Clifford S. Russell eds., 2005).

37. OTTMAN, *supra* note 33, ch. 6.

38. Thomas Bue Bjørner et al., *Environmental Labeling and Consumers’ Choice—An Empirical Analysis of the Effect of the Nordic Swan*, 47 J. ENVTL. ECON. & MGMT. 411 (2004).

39. *Id.* at 429.

40. Karl E. Henion, *The Effect of Ecologically Relevant Information of Detergent Sales*, 9 J. MARKETING RES. 10 (1972) (phosphate content in detergents); Mario F. Tiesl et al., *Can Eco-Labels Tune a Market? Evidence From Dolphin-Safe Labeling*, 43 J. ENVTL.

bel or the information about environmental attributes has increased willingness to pay for the good or increased sales. In the remaining two cases results are mixed.”<sup>41</sup> Note that there appear to be few if any personal health benefits associated with the environmentally responsible products being studied—toilet paper, paper towels, detergents, apparel, electricity, and dolphin-safe tuna. Thus, there is clearly evidence that even in the absence of any direct personal health benefits, information provided about the environmental benefits of products may affect consumer purchase behavior.

### C. *Experimental Game Theory*

In addition to direct observation of consumer purchase decisions for environmentally friendly products, a literature has developed in experimental game theory, where individual behavior is tested against theories such as altruistic and reciprocal behavior. While only a handful of experimental papers have explored behavior in the context of environmental issues directly, this literature has added to our understanding of why individuals act in the “public” interest even when it might otherwise appear to be against their own self-interest. For example, researchers have been able to help sort out the extent to which public-spirited behavior is altruistic (because individuals gain utility from knowing that others are better off) as opposed to reciprocal (where the individual expects some return such as enhanced reputation within the

community). The experimental studies conducted to date appear to support the “reciprocal” nature of giving to public projects and charity.<sup>42</sup>

### VI. Conclusion

This Article has argued that rational, utility-maximizing individuals might find it in their own interest to take actions that protect the environment—even if they do not personally receive the full benefits of that environmental improvement. There are numerous mechanisms that might encourage such behavior including laws that regulate individual behavior (with resulting monitoring and punishments for violations), taxes or fees on pollution or behavior that causes pollution, subsidies on environmentally friendly behavior, providing information about the environmental benefits of certain behaviors, and finding ways to foster social norms that encourage environmentally friendly behavior. Which combination of levers is most appropriate will depend upon an assessment of the costs and benefits of alternative policies.

However, an important cautionary note is in order. This Article has reviewed the underlying economic theory of individual behavior as it relates to environmental issues. As such, it is largely a positive analysis that seeks to explain behavior. Those who want to affect behavior can obviously use this information in predicting the effectiveness of proposed programs. To that extent, the economic theories and empirical evidence described here could be considered prescriptive. Yet there is also an important normative component to economics. Just because a policy might induce consumers to reduce their environmental footprint does not necessarily mean it is in society’s best interest to go down that path. Instead, economics will tell you to take a full accounting of the costs and benefits of any proposal (and its alternatives) before determining if it is socially beneficial.

ECON. & MGMT. 339 (2002) (dolphin-safe tuna); Russell Blamey & Jeff Bennett, *Yea-Saying and Validation of a Choice Model of Green Product Choice*, in THE CHOICE MODELLING APPROACH TO ENVIRONMENTAL VALUATION (Jeff Bennett & Russell Blamey eds., 2001) (unbleached/recycled paper for toilet paper); Jeff Bennett et al., *Green Product Choice*, in THE CHOICE MODELLING APPROACH TO ENVIRONMENTAL VALUATION, *supra* (unbleached/recycled paper for toilet paper); Wesley Nimon & John Beghin, *Are Eco-Labels Valuable? Evidence From the Apparel Industry*, 81 AM. J. AGRIC. ECON. 801 (1999) (environmentally friendly dyes and organic cotton); Brian Roe et al., *U.S. Consumers’ Willingness to Pay for Green Electricity*, 29 ENERGY POL’Y 917 (2001) (certified green electricity); and Mario F. Teisl et al., *Ecocertification: Why It May Not Be a “Field of Dreams,”* 81 AM. J. AGRIC. ECON. 1066 (1999) (certified green electricity).

41. Bjørner et al., *supra* note 38, at 414.

42. See, e.g., Rachel T.A. Croson, *Differentiating Altruism and Reciprocity*, in THE HANDBOOK OF EXPERIMENTAL ECONOMICS RESULTS (Charles R. Plott & Vernon L. Smith eds., 1998); Marco Casari & Charles R. Plott, *Decentralized Management of Common Property Resources: Experiments With a Centuries-Old Institution*, 52 J. ECON. BEHAV. & ORG. 217 (2003).