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## **An Economic Model of Moral Motivation**

**Abstract:**

In this paper, we present an economic model of moral motivation. Consumers prefer regarding themselves as socially responsible individuals. Voluntary contributions to public goods are motivated by this preference. The self-image as socially responsible is determined by a comparison of one's actual behavior against an endogenous moral ideal. Public policy influences voluntary contributions through its effects on relative prices and budget or time constraints, but also indirectly through the policy's effect on the moral ideal. This implies that economic incentives may have adverse effects on contributions. We present survey data on recycling behavior and voluntary community work, which is consistent with the model predictions.

**Keywords:** Voluntary contributions, economic incentives, warm glow, identity theory

**JEL classification:** D11, H41

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# 1. Introduction

Voluntary contributions to public goods are a part of everyday life. We vote to preserve democracy, recycle our household waste, send money checks to the World Wildlife Fund, volunteer at the local school, and carry our dirty trash all the way back home when hiking. Nevertheless, from the point of view of neoclassical economic theory, this behavior seems hard to explain.<sup>1</sup>

Assuming that people truly care about each other's welfare is not enough to explain the large contributions to public goods that can be observed in practice. Andreoni (1988) demonstrated that with pure altruism, average contributions to public goods will be close to zero in large economies. He pointed out that the existence of Red Cross, the Salvation Army, and the American Public Broadcasting thus appeared to be inconsistent with standard consumer theory. Andreoni's solution to the apparent paradox was to introduce a private benefit of contributing, "the warm glow of giving" (Andreoni, 1990). However, while this *impure altruism model* was a major step towards an economic understanding of voluntary contributions, several phenomena remain unexplained.

Price incentives sometimes have unexpected effects on voluntary contributions. For example, Frey and Oberholzer-Gee (1997) found that respondents' willingness to accept a hazardous waste treatment plant in their local neighborhood *decreased* if monetary compensation was offered. A similar phenomenon appears in the evidence reported below: In Norway, many clubs and organizations arrange an event called *dugnad* once or twice a year, in which members meet on a voluntary basis to do practical work for the organization (painting the club house, setting up a new playground, etc). Many respondents to an interview survey we conducted said that if a fee for not showing up at the *dugnad* were introduced, they would participate *less frequently*, which is apparently inconsistent with the impure altruism model.

The impure altruism model cannot explain such behavior: A fee on non-participation corresponds to a subsidy on voluntary contributions, which *increases* contributions in Andreoni's model.<sup>2</sup> The described behavior is consistent with Bruno Frey's (1997) crowding theory, which is based on cognitive evaluation theory from social psychology (Deci and Ryan, 1985): Frey argues that although external incentives such as fees increase economic incentives to contribute, they can reduce individuals' internal or intrinsic motivation. Nevertheless, Frey's theory does not explain the presence of intrinsic motivation to contribute in the first place.

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<sup>1</sup> For discussions of this, see for example Sen (1977), Sudgen (1984), Bernheim (1986).

<sup>2</sup> In the pure altruism model, the subsidy will have no effect on contributions (Andreoni 1990).

Another puzzle is the issue of complexity in moral judgements. Our impression is that voluntary contributions are frequently backed by quite sophisticated reasoning. Individuals seem to consider a whole range of questions, although they might not consciously repeat these considerations each and every time they make a contribution: How important is this issue for a good society? Who will benefit? Are their needs justified? What would happen if everybody acted like me? Is it my duty to do something about this, or can I safely leave the responsibility to someone else?

If it is true that individuals condition their actual contributions on the answers to these and similar questions, we would for example expect that contributions depend on information: If new information reveals that recycling is less important for a good environment than previously thought, we would expect people to recycle less. The data presented below indicates that such information effects may be important. However, neither the impure altruism model nor crowding theory deal with the impact of new information.

The approach of dual or multiple preferences (see Harsanyi 1955; Sen 1977; Margolis 1982; Nyborg 2000) acknowledges individuals' ability to make sophisticated moral reasoning as described above. In the present paper, we integrate this framework with traditional neoclassical consumer theory. Our purpose is to provide a framework for understanding the relationships between moral motivation, economic incentives, public policy and actual consumer choice. In so doing, we use the identity philosophy of Mead (1913) (see also Brekke and Howarth, 1999). The focus on identity in explaining voluntary contributions is also found in the expressive preferences approach of Brennan and Lomasky (1993). In contrast to Brennan and Lomasky, however, we endogenize the ideal individuals strive towards.

March and Olsen (1995) contrast two different modern views of governance. The first is what they call an exchange perspective, corresponding nicely to the classical Homo Economicus model. The exchange perspective assumes that individual action depends on the answers to three questions: "What are the alternatives? What are the consequences that will follow from each alternative? What is the value, in terms of preferences of the decision maker, of the consequences?" (p. 7). The second view is an institutional perspective, "(...) built around ideas of identities and conceptions of appropriate behavior. It assumes that individual action depends on the answers to three different questions: What kind of a person am I? What kind of situation is this? What does a person such as I do in a situation such as this?" (p. 7).

Our model integrates these two perspectives. We assume that people want to think of themselves as socially responsible ("What kind of a person am I?"). We further assume that individuals' perceived

social responsibility varies with external conditions and public policy ("What kind of situation is this?"). Based on the first two questions, the individual considers a third one, slightly different from March and Olsen's: "What should a person such as I *ideally* do in a situation such as this?" However, when it comes to *actual* choices, we assume that individuals make trade-offs between the wish to be socially responsible and the desire for consumption and leisure, based on costs and benefits; corresponding to the above three questions of the exchange perspective.

In our model, individuals first determine their morally ideal effort by asking themselves the following question: "What would the consequences for social welfare be if everybody acted like me?" In the second step, individuals maximize utility, trading the benefits of maintaining a self-image as a socially responsible person against the costs. Self-image is determined by a comparison of one's actual effort to the morally ideal effort. This line of thought implies that contributions are motivated by a private good similar to Andreoni's "warm glow"; i.e. the benefits of a good self-image. This may be taken to indicate a rather cynical view on moral behavior as simply serving the private interest of having good conscience. However, in our model, this private good is essentially linked to true moral reasoning: Improving one's self-image as a socially responsible person is only possible by making one's own effort come closer to one's own moral ideal. Thus, a better self-image can only be obtained by doing what one truly believes to be morally right.

The paper proceeds as follows. In section 2, the formal model is presented. Then we analyze the effects of changed information or increased productivity of effort in section 3, while the impacts of economic incentives are discussed in section 4. Section 5 reports some results from an interview survey with about 1200 respondents conducted in 1999. Section 6 concludes.

## 2. The model

Assume that the society consists of  $N$  identical individuals with utility functions given by

$$(1) \quad U_i = u(x_i, l_i, G, I_i)$$

where  $x_i$  is  $i$ 's consumption of private goods,  $l_i$  is leisure,  $G$  is a pure public good, and  $I_i$  is a measure of the individual's self-image as a socially (or morally) responsible person.<sup>3</sup> The utility functions are assumed to be increasing and strictly quasi-concave. For simplicity, we assume that labor supply and

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<sup>3</sup> Allowing heterogeneous consumers is possible, but would complicate the reasoning considerably. This would require a better specification of the Kantian rule discussed below, more specific assumptions concerning subjective interpersonal utility comparisons, and a clarification of whose normative views are reflected in the social welfare function.

income are exogenously fixed, since our focus will be on the choice of leisure versus spending time to contribute to the public good.

The time constraint of each individual is

$$(2) \quad l_i + e_i = T$$

where  $e_i$  is the individual's effort, measured in units of time, to contribute to increased supply of the public good (for example through recycling efforts).  $T$  is each individual's exogenous total time constraint minus the individual's exogenous labor supply, which is assumed to be equal for all. Again to simplify, we disregard monetary contributions to the public good.

The total amount of the public good depends on public provision  $G_p$ , and private provision  $\sum_i g_i$ :

$$(3) \quad G = G_p + \sum_i g_i$$

where

$$(4) \quad g_i = \gamma(e_i, \theta)$$

is household  $i$ 's production function for the public good. Here,  $\theta$  is an efficiency parameter exogenous to consumers, reflecting institutional or technical issues. We assume that  $\gamma(0, \theta) = 0$ , as well as  $\gamma_e > 0$ ,  $\gamma_{ee} < 0$ ,  $\gamma_\theta > 0$ , and  $\gamma_{e\theta} > 0$ ; i.e. increases in the efficiency parameter increases the output of public good resulting from marginal efforts.

An individual's self-image as a socially (morally) responsible individual is determined by the relationship between her actions and her morally ideal actions. Let  $e_i^*$  denote the morally ideal effort from  $i$ :

$$(5) \quad I_i = f(e_i, e_i^*)$$

Let  $f_1$  be the derivative with respect to  $e_i$ , and  $f_2$  be the derivative with respect to  $e_i^*$ . With regard to a positive self-image, one can do no better than contributing the morally ideal effort. Thus, we will assume that for any given  $e_i^*$ ,  $f(e_i, e_i^*)$  has a global maximum at  $f(e_i^*, e_i^*) = K$ , where  $K$  is a constant. Thus, if  $e_i < e_i^*$ ,  $f_1 > 0$ ; if  $e_i = e_i^*$ ,  $f_1 = 0$ , while if  $e_i > e_i^*$ ,  $f_1 < 0$ . Further,  $f_2 < 0$  for  $e_i < e_i^*$ ,  $f_2 >$

0 for  $e_i > e_i^*$  and  $f_2 = 0$  for  $e_i = e_i^*$ . We assume that  $f$  is twice continuously differentiable and concave in  $e_i$ , so  $f_{11} < 0$ .<sup>4</sup>

Before deciding her actual behavior, the individual considers what is her morally ideal effort. Assume that all individuals share a utilitarian moral philosophy, in the sense that they think the interests of every individual should count equally in evaluations of social welfare:<sup>5</sup>

$$(6) \quad W = u_1 + \dots + u_N$$

To find the morally ideal effort  $e_i^*$ , the individual asks herself: "Which action would maximize social welfare, given that everyone acted like me?": a simple version of Immanuel Kant's Categorical Imperative.<sup>6</sup> The answer to this question is found by maximizing  $W$  with respect to  $e_i$ , subject to (1)-(5) and  $e_i = e_j$  for all  $j \neq i, j = 1, \dots, N$ .<sup>7</sup> Thus, in our model, there is no conflict between the utilitarian moral philosophy and the Kantian Categorical Imperative: Utilitarianism (or any other social welfare function) defines what a good society is, while the Kantian rule determines the relevant assumptions to make about others' behavior when determining one's own morally ideal action.<sup>8</sup>

Using that all consumers are identical, so that subscripts denoting individuals can be omitted, this yields the first order condition

$$(7) \quad u_l = N u_G \gamma_e$$

where subscripts denote derivatives.<sup>9</sup> Thus, if everyone contributed the morally optimal effort, the marginal utility of leisure for any individual would exactly equal the social benefits of the public good produced by the marginal effort. The maximization exercise implies that social efficiency is an important factor when considering the morally ideal action.

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<sup>4</sup> One example of a functional form which satisfies these requirements is  $f(e, e^*) = -a(e - e^*)^2$ , where  $a > 0$ . An alternative specification is  $f(e, e^*) = -(e/e^* - 1)^2$ .

<sup>5</sup> This particular social welfare function is chosen only for simplicity. Replacing it with some other welfare function may change certain properties of the model predictions, but would not alter the main logic of our argument.

<sup>6</sup> In a model with heterogenous consumers, the adequate question would be: "Which general rule of action would maximize social welfare, as I perceive it, given that everyone acted according to the same general rule as I?" The morally ideal action would then be a function of one's own individual characteristics, for example income and/or preferences.

<sup>7</sup> Note that the inclusion of the identity variable does not affect the optimization exercise above since  $I_i(e_i^*, e_i^*) = K$  regardless of the value of  $e_i^*$ .

<sup>8</sup> Thus, the perception of a good society is based on a consequentialistic reasoning, while the view of one's own role in striving for a good society can be regarded as deontological.

<sup>9</sup> Note that the term  $u_{fj}$  disappears from the first order condition because in the Kantian optimum, everybody contributes the morally ideal effort, implying that  $f_i = 0$ .



After solving the Kantian social welfare maximization problem, the individual maximizes utility (equation 1) subject to her time constraint and the identity function (equations 2 - 5). This determines her actual behavior. In this latter problem,  $e^*$  is regarded as exogenous, and all other agents are assumed to maximize utility. This yields a Nash equilibrium characterized by the first order condition

$$(8) \quad u_l = u_G \gamma_e + u_l f_l$$

evaluated at the Nash equilibrium level of public good,  $G = G_p + Ng'$ , where  $g'$  is the equilibrium contribution from the representative individual. Note that as all individuals are equal, all individuals contribute the same amount of time.

(7) and (8) demonstrate that maximization of individual utility cannot yield the socially optimal allocation, even with preferences for maintaining self-identity as morally responsible. For this to be the case, (7) and (8) must be equivalent, which would be the case if  $(N-1) u_G \gamma_e = 0$ , since in the Kantian optimum,  $f_l = 0$ . Hence, this would require that effort did not have any social benefits, i.e.  $u_G = 0$  and/or  $\gamma_e = 0$ , which is not consistent with our assumptions. The intuitive explanation is that since effort is costly, individuals will only increase effort until a further increase will not pay off in terms of a better self-image. In the social optimum, the benefit in terms of a better self-image is, on the margin, zero. We will never have oversupply of individual provisions, i.e. it will never be individually optimal to provide more effort than  $e = e^*$ ; in that case, the marginal effect on identity would be negative. We can thus conclude that preferences for a positive self-image lead to underprovision of public goods.

This conclusion parallels that of the impure altruism model (Andreoni, 1990), but the reason for underprovision is different in the two models. The inclusion of a warm glow effect in Andreoni's model induces consumers to contribute more than otherwise, but it also increases the socially optimal provision, since the warm glow counts in the social welfare optimum. Underprovision is due to the public good element, and the underprovision would increase with  $N$ . In contrast, the inclusion of  $I_i$  in the utility function does *not* affect the social optimum in our model: By assumption, self-image is always at its maximum  $K$  in the social optimum. The preference for a positive self-image, though otherwise similar to a warm glow effect, thus only affects the private utility maximization. However, we still get underprovision, because the marginal improvement in one's self-image goes to zero as effort approaches the ideal  $e^*$ . In our model underprovision is independent of  $N$  but depends only on the shape of  $f$ .

### 3. Increased efficiency

Assume now that an exogenous shift in the efficiency parameter  $\theta$  occurs. For example, the government may introduce a curbside pick-up system for recycled household waste, implying that households can deliver the same amount of recycled waste as before, but still spend less time on recycling activities<sup>10</sup>. To simplify further, we assume that the utility function is additively separable in  $(x, l)$ ,  $G$  and  $I$ , and that the marginal utility of  $I$  is 1. The latter assumption is without loss of generality. The utility function thus becomes

$$U = u(x, l) + v(G) + I,$$

where  $u$  and  $v$  are increasing and concave. The effect on the morally ideal effort can be found by differentiating the first order condition (7)<sup>11</sup> from the Kantian welfare maximization with respect to  $\theta$ :

$$(9) \quad e_{\theta}^* = N \frac{v_G \gamma_{e\theta} + N v_{GG} \gamma_e \gamma_{\theta}}{-u_{ll} - N^2 v_{GG} \gamma_e^2 - N v_G \gamma_{ee}}$$

As seen from (9), the denominator is positive. However, in the nominator there are two opposing effects: First, when  $\theta$  increases, the marginal productivity of effort increases (as  $\gamma_{e\theta} > 0$  by assumption), implying that the public good has become cheaper to produce on the margin. *Ceteris paribus*, this effect implies higher effort in the Kantian optimum. Secondly, for a given effort, an increase in  $\theta$  will increase individual contributions  $g_i$  and thereby also the total public good provision  $G$ . This implies a reduction in the marginal utility of the public good, and the partial effect of this is that the ideal effort decreases. Thus, the ideal effort will generally change when  $\theta$  increases, but we cannot tell a priori in which direction. Individual ideal *contributions*, however, i.e.  $g_i^* = \gamma(e_i^*, \theta)$ , will always be increasing in  $\theta$ .

To study the effect of changed technology on *actual* effort, we differentiate the first order condition (8) with respect to  $\theta$ . Assume that any single individual is unable to perceive the difference in environmental quality from a change in his own actual effort; i.e.  $u_G \gamma_e = 0$ . The first order condition for Nash equilibrium is then  $u_l = f_l$ , i.e. individuals provide more effort until the benefit (in terms of a better self-image) obtained by a marginal increase in effort equals the marginal utility of leisure. The marginal effect on actual contributions from a technology change is given by

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<sup>10</sup> New information that recycling has a higher environmental impact than previously thought gives similar effects.

<sup>11</sup> The first order condition defines  $e$  as a function of  $\theta$ :  $u_l(x, T - e(\theta)) \equiv N v'(N \gamma(e(\theta), \theta)) \bullet \gamma'(e(\theta), \theta)$ . Differentiating with respect to  $\theta$  and rearranging gives (9).

$$(10) \quad e_{\theta} = \frac{f_{12}e^*_{\theta}}{-u_{11} - f_{11}}$$

With standard concavity assumptions, the denominator is positive, and hence the effect on effort of increased efficiency depends on the sign of  $f_{12}e^*_{\theta}$ . Note first that with an exogenously given ideal effort, there would be no effect on actual equilibrium efforts of a shift in  $\theta$ . As demonstrated above,  $e^*_{\theta}$  may be positive or negative. The cross derivative  $f_{12}$  will always be positive if  $e_i$  is sufficiently close to  $e^*$ ; i.e. if the actual effort is large enough, an increase in the *ideal* effort will increase the marginal self-image improvement obtained by increasing *actual* effort.<sup>12</sup>

If consumers did not have a preference for a good self-image, or if the ideal were exogenously given, increased efficiency of voluntary contributions could never lead to a decrease in individual utility. Increased efficiency would then simply increase the consumer's opportunity set, implying that the consumer might choose to behave just like before and thus get the same utility as before. In Andreoni's (1990) impure altruism model, there is no explicit modelling of why there is a "warm glow of giving", and hence no modelling of how increased efficiency will affect the "glow". However, if we re-interpreted our identity variable  $I_i$  as a "warm glow", determined by  $I_i = f(e_i)$  (i.e.,  $e^*$  does not enter the expression), increased efficiency would (weakly) increase utility. However, in our model, increased efficiency may *decrease* utility, because increased efficiency can imply a higher morally ideal contribution  $e^*$ . Then, if effort is kept at the initial level, the consumer will be further away from her moral ideal than before, which has a direct negative impact on utility. For example, if a curbside collection system for recycled household waste is introduced, consumers may feel that if they do not respond by increasing their recycling efforts, their self-image is harmed.

## 4. Responsibility and economic incentives

We will now introduce economic incentives into the model. Let us do this by means of a simple example. Assume an organization, for example a sports club, where an important task which will benefit all members (such as constructing a new soccer field) is to be done. In accordance with the Norwegian custom of *dugnad* mentioned in the introduction, the organization decides to perform the task on a volunteering do-it-yourself basis. Each individual chooses to show up at the *dugnad* ( $e_i = 1$ ) or not ( $e_i = 0$ ). The quality  $G$  of the task completed depends on the number of people that participate. Assume,

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<sup>12</sup> To see this, note that since  $f_1(e^*, e^*) = 0$ , we will have  $f_{12}(e^*, e^*) + f_{11}(e^*, e^*) = 0$ , and  $f_{12}(e^*, e^*) = -f_{11}(e^*, e^*) > 0$ . It follows that  $f_{12}(e, e^*) > 0$  for  $e$  sufficiently close to  $e^*$ . If, for example,  $f(e, e^*) = -a(e - e^*)^2$  (where  $a > 0$ ), we always have  $f_{12}(e, e^*) > 0$ . If  $f(e, e^*) = -(e/e^* - 1)^2$ , we have  $f_{12}(e, e^*) > 0$  if  $e > e^*/2$ . A negative  $f_{12}$  can be interpreted as a discouragement effect: When the ideal moves further away from one's actual contribution, the marginal effort seems less substantial; thus, the self-image benefit obtained becomes too small to be worth the cost.

as above, that the utility function can be written  $U = u(x, l) + v(G) + I$ . Let us further assume that  $\gamma(l, \theta) = g^p$ , and that

$$(11) \quad I_i = -a(e_i - e^*)^2 \quad a > 0.$$

The morally ideal contribution  $e_i^*$  is found by considering whether participation or non-participation from every individual yields the highest social welfare. Since individuals are identical, the Kantian welfare maximization exercise implies that  $e_i^* = l$  if

$$(12) \quad u(m, T-l) + v(Ng^p) > u(m, T) + v(0)$$

i.e. if the increased public good supply has a higher value for the members than their lost leisure time. Here,  $m$  is the individual's exogenous income (when a fee is introduced below, consumption  $x$  and income  $m$  may differ).

If (12) holds, individuals can improve their self-image through participation, but at a cost of less leisure. Assume that (12) holds. With no fee for non-participation, full participation is then a Nash equilibrium if

$$(13) \quad u(m, T-l) + v(Ng^p) > u(m, T) + v((N-l)g^p) - a,$$

i.e. if the utility loss due to less leisure is outweighed by the benefits in terms of increased public good supply and a better self-image. Similarly, no participation is a Nash equilibrium if

$$(14) \quad u(m, T) + v(0) - a > u(m, T-l) + v(g^p)$$

With the assumptions made here, (13) and (14) cannot hold simultaneously, so there will be a unique Nash equilibrium.

Now, assume that a fee  $t$  for non-participation is introduced. Suppose first that  $t = c$ , where  $c$  is the unit cost of public good provision in the marketplace, implying that the collected fees are exactly sufficient for the organization to increase the public good by  $N$  even without participation. Assume that each individual knows that  $t = c$ , and that everyone also assumes that the purpose of the fee is to buy services in the marketplace to ensure that  $G = N$ . Then,  $G = N$  will be exogenously fixed when individuals make their Kantian optimization to determine  $e^*$ , since no matter what every individual chooses to do, the public good provision equals  $N$ . One interpretation of this situation is that

individuals leave the responsibility of ensuring a sufficient public good supply to the organization's leadership.

Non-participation ( $e^* = 0$ ) is now the morally ideal action if

$$(15) \quad u(m, T-1) + v(Ng^p) < u(m-c, T) + v(Ng^p)$$

i.e. if a unit of leisure is more valuable to individuals than the consumption equivalent of the fee. In this case, individual utility maximization will yield non-participation too. Full participation will be a Nash equilibrium only if

$$(16) \quad u(m, T-1) + v(Ng^p) - a > u(m-c, T) + v(Ng^p)$$

which is inconsistent with (15).

It is perfectly possible that both (12) and (15) hold, i.e. that the project is socially desirable, but that members would prefer market provision, financed by a fee, to participation in the *dugnad*. In this case, the introduction of a fee will weakly reduce participation: If full participation is the unique Nash equilibrium initially, no participation may become the unique Nash equilibrium when a fee is imposed.

On the other hand, suppose that the fee is merely symbolic; intended to serve as an incentive to participate, but not nearly sufficient to finance external provision:  $t < c$ . The tax income is used to buy the public good in the market, but the services bought cannot replace all the work that was supposed to be done voluntarily. Hence, if people do not show up, the quality of the public good will be affected. Then,  $e_i^* = 1$  if

$$(17) \quad u(m, T-1) + v(Ng^p) > u(m-t, T) + v(Nt/c)$$

i.e. if the loss of leisure by participation counts less for the individual than the fee payment and the lower public good supply resulting if nobody participates.

Assume that both (12) and (17) hold. In this case, the fee does not change the morally ideal effort  $e^* = 1$ . Further, a reasonable assumption seems to be that  $(u(m-t, T) + v(t/c))$  is decreasing in  $t$ ; implying that in a situation with no initial public good supply, the individual cannot increase her utility by "imposing a fee on herself" and buy a unit of the public good  $G$  individually in the market place.

Under these assumptions, a symbolic fee weakly increases participation. At the same time, however, a more substantial fee, which is sufficient to cover costs, may *decrease* participation.<sup>13</sup>

Note, however, that the essential feature of the fee is not its size as such, but whether it is *believed* to be symbolic or sufficient. If perceived as sufficient to buy the required services in the marketplace, the fee gives moral justification for not showing up. This implies no problem for the organization if perceptions are correct. However, if members incorrectly believe that the fee is sufficient to finance external supply, and introduction of a fee changes the Nash equilibrium from full participation to no participation, reduced welfare will be the result.

## 5. Empirical evidence

To test the empirical relevance of the assumptions and the theoretical implications of the model, we used Statistic Norway's Omnibus survey for November-December 1999. This is an interview survey which is conducted 4 times a year. A large number of background variables are included routinely, while additional questions are included in the survey questionnaire on a payment-per-minute basis. The November-December survey of 1999 had a gross representative sample of 1982 individuals of age 16-79, and a response rate of 59 percent<sup>14</sup>. The main sampling method was in-person interviews conducted at home visits (76%), although some interviews were conducted by telephone (24%). Our survey questions were concerned with recycling of household waste and participation in *dugnads*.

### Utility and increased efficiency

As explained above, increased efficiency of voluntary contributions may *decrease* utility in our model. Thus, if local authorities arrange for easier delivery of recycled household waste, for example by introducing or extending curbside collection, we would like to know whether at least some consumers consider this a personal disadvantage. Table 1 reports our results on this issue.

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<sup>13</sup> A similar result is obtained in the symbolic fee case if we assume that the planned public good supply  $Ng^p$  is realized through market supply if members do not show up, and that the excess costs  $((c-t)$  times the number of non-participants) are distributed equally among members.

<sup>14</sup> The net sample has a slight overrepresentation of individuals aged 25 to 44 and underrepresentation of those between 67 and 79. There is also a slight underrepresentation of people from the Eastern part of Norway and overrepresentation from the less urban Southern and Western parts.

**Table 1. Personal utility effects of extended recycling arrangements. Number of respondents = 990.<sup>15</sup>**

<i>Assume that the municipality arranges for more recycling in homes<sup>16</sup>. Recycling is voluntary. Which of the following statements do you mostly agree on?</i>	Responses, percent
It is good that the environment is taken more into account, but for me personally it is a disadvantage that more effort is expected	26.0
It is good that the environment is taken more into account, and for me personally it is an advantage that I now can increase my effort <sup>17</sup>	39.7
It would not mean anything to me	33.7
Don't know	0.6

Within the framework of a traditional warm glow or pure altruism model, it is hard to see why 26 percent of respondents regard an extended collection system as a disadvantage for themselves<sup>18</sup>.

Within our model, this is not unexpected.

### Effects of information

Secondly, in our model, consumers care not only about the size of their contribution per se, but on the contribution's effects on social welfare. Thus, information indicating that voluntary contributions are more important for social welfare than previously thought would be expected to change the morally ideal effort, and thus also, in general, actual effort.

Information that recycling is more important for the environment has quite similar effects as an increase in the efficiency parameter  $\theta$ .<sup>19</sup> Provided that  $f_{12} e^*_{\theta} > 0$ , the prediction of our model is that actual recycling will increase.<sup>20</sup>

One half of the sample were asked the following question: *If you got new information that recycling is more important to the environment than earlier assumed, would you recycle as before, more, or less*

<sup>15</sup> This question was posed only to those who responded "yes" to the following: "Do you think recycling contributes to a better environment?"

<sup>16</sup> In retrospect, we see that "arranges for more recycling" is not a very precise phrase. We still believe the most reasonable interpretation of the question is that voluntary efforts are facilitated through extended collection systems.

<sup>17</sup> Note that the Norwegian term used for "effort" ("*innsats*") can also be taken to mean "contribution". The same word was used in both response alternatives.

<sup>18</sup> Costs of the public collection system is not considered here; this would of course have to be taken into account in a less partial model.

<sup>19</sup> To analyze this particular question, re-define variables so that  $g_i$  is the actual impact on environmental quality, while  $e_i$  is the amount recycled.

<sup>20</sup> In this particular setting, the formulation "recycling is more important" makes it reasonable to assume that  $e^*_{\theta} > 0$ .

than before? 46 percent would recycle more, while only 2 percent would recycle less. The other half of the sample were asked the same question, but with "more important" replaced by "less important". Correspondingly, 29 percent would reduce their recycling, while only 3 percent would increase it.

These results are intuitively very unsurprising. Nevertheless, if we for example replace (5) with  $I_i = f(e_i)$ , in which case our model may be interpreted as one version of Andreoni's (1990) impure altruism model, such effects would not occur, since warm glow is then connected to contributions as such, not to their social importance.

### **The effects of economic incentives**

Third, according to our theory, a fee for non-participation in voluntary community work may *decrease* participation: The fee will add an incentive to participate if it is perceived as symbolic, but give moral justification for not showing up if it is perceived as sufficient to buy the required services in the marketplace. The impure altruism model cannot explain such behavior: A fee on non-participation corresponds to a subsidy on voluntary contributions, which *increases* contributions in Andreoni's (1990) model. The described behavior may seem more consistent with Frey's (1997) crowding theory. However, in the crowding theory, there is no presumption that effects should depend on whether the fee is sufficient to cover costs or not.

In our survey, 69 per cent of the sampled population were members of organizations using *dugnads* (voluntary community work), and only 12 per cent of these respondents reported that they never participate. All members of organizations using *dugnads* received the a question, reported in the following table (responses in percentage):



**Table 2. Effects on *dugnad* participation (voluntary joint community work) of a fee for non-participation. Percent. Number of respondents = 802<sup>21</sup>**

<i>"Suppose that you have to pay NOK<sup>22</sup> 100 as an extra subscription if you do not participate in the dugnad. This is enough (not enough) to pay professionals to do the job. Would you participate more often, more seldom, or would it not affect your participation in the dugnad?"</i>		
	The fee is enough to pay professionals	The fee is not enough to pay professionals
I would participate more often	10	19
I would participate more seldom	15	3
It would not affect my participation	75	77
Don't know	1	1

All respondents received both the "enough" and "not enough" versions.<sup>23</sup> Note in particular that as much as 15 per cent would *reduce* their participation when the fee is enough. This seems hard to explain within the framework of alternative theories, but fits nicely with the predictions of our model.

## Motivation

We also asked respondents more directly about their motivation for voluntary recycling efforts. Those who did recycle at least some household waste, were asked to report to what extent they agreed with the statements in Table 3 (agree, agree partially, disagree partially, disagree):

**Table 3. Motivation for recycling. Percent. Number of respondents = 1102.**

<i>I recycle partly because...</i>	Agree	Agree partially	Disagree partially	Disagree	Don't know
<i>I want to think of myself as a responsible person</i>	42	31	8	18	1
<i>I want others to consider me a responsible person</i>	22	19	12	46	2
<i>I consider it an imposition from the authorities</i>	38	25	11	26	1
<i>It is a pleasant activity in itself</i>	16	22	18	44	1
<i>I should myself do what I want other people to do</i>	65	23	5	6	1
<i>I want to contribute to a better environment</i>	86	11	2	1	1

<sup>21</sup> The question was not posed to those who said they were not members of organizations using *dugnads* (31 percent).

<sup>22</sup> 100 NOK = 10,80 USD (Dec 3<sup>rd</sup>, 2000).

<sup>23</sup> The order of these questions were reversed for half of the sample, but this did not appear to affect the results substantially.

Several results in Table 3 support our model: 97 percent agree or partly agree that one of the reasons why they recycle is the desire to contribute to a better environment.<sup>24</sup> 73 percent agree or partially agree that one of their motives is a wish to regard themselves as a responsible person, while 88 percent agree or partially agree to the Kantian idea that they should do themselves what they would like others to do.

However, other motives are obviously present as well. Surprisingly, as much as 38 per cent of respondents agree or partially agree on the assertion that they recycle because they find this pleasant in itself. 41 percent agree, wholly or partially, that they recycle because they want *others* to think of them as responsible.<sup>25</sup>

Further, as much as 63 percent agree or partly agree that their recycling is imposed by the authorities. There is no national law obliging individuals to recycle in Norway, but local waste collection systems vary considerably, and although it is unclear to what extent municipalities can actually *impose* recycling on households, there is little doubt about the fact that many households *perceive* recycling efforts as compulsory.

In the question reported in Table 1 above, it is clearly specified that increased recycling efforts would be voluntary. However, if consumers for some reason still perceive the increased recycling efforts as involuntary, this might provide an alternative explanation of the observation that some consumers regard an extended recycling system as a personal disadvantage. Among those who agree completely that they recycle partly because it is imposed by the authorities, 29 percent said that greater emphasis on recycling in households would be a disadvantage to them personally; while for the entire sample, this percentage was 26. Thus, this can hardly explain the results in Table 1.

## 6. Conclusions

In the model presented in this paper, consumers have a preference for thinking of themselves as socially responsible. In this respect our model has similarities to "warm glow" models, since seemingly unselfish behavior is ultimately motivated by a private good. However, there are important differences. In the present model, a consumer's self-image can only be improved by striving towards what he truly believes to be morally right. This implies that consumers are morally sophisticated, in

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<sup>24</sup> Respondents would probably report this even if they were only interested in a "warm glow" (Andreoni, 1990), not a better environment as such. In the pilot tests we did not include this response alternative, since we were not sure of its informative value. However, this omission provoked very negative reactions from respondents who felt that their true motivation was not acknowledged.

<sup>25</sup> For a discussion of social approval as an incentive to individual contributions, see e.g. Holländer (1990).

the sense that they do elaborate on the social welfare consequences of alternative rules of behavior, and they do take their conclusions on this into account when making actual choices.

Still, the benefits of a good self-image will be traded against its costs. As in Andreoni's (1990) impure altruism model, our model implies that there will always be underprovision of public goods, although the reasons for underprovision are different. In contrast to Andreoni's model, however, our theory implies that economic incentives for voluntary contributions may have adverse effects on contributions. Public policy affects behavior not only through its effect on relative prices and budget and/or time constraints, but also through the policy's effects on individuals' perception of the morally ideal action. Survey data on recycling and voluntary community work presented above is consistent with these ideas.

For the sake of simplicity, the model presented in our paper is very stylized. When the model is extended to take heterogeneity into account, both with respect to individual characteristics, preferences and views on moral philosophical issues, things become substantially more complex. Further, our focus has been on moral, not social, norms; the desire to gain social acceptance has been entirely disregarded (see Lindbeck 1997, Nyborg and Rege 2000). We still believe, however, that our simple model illustrates some important points. First, true moral motivation is not incompatible with utility maximization; and secondly, public policy may have indirect effects on behavior through its effects on moral motivation.

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## **The Omnibus survey on dugnad and recycling.**

### **Questions on dugnad (volunteer community work):**

*Instruction to interviewers: If there is doubt on the meaning of “you” in the questions below, i.e., if it means the entire household or just oneself, we are interested in the personal effort of the person interviewed.*

D1.

Do you usually participate in dugnads in, e.g., kindergarten, housing co-operative, sport clubs or similar? Do you participate always, often, seldom, never, or are you not a member of organisations having dugnad?

- a) Always
- b) Often
- c) Seldom
- d) Never
- e) I am not a member of organisations having dugnad → question K1

The succession of D2 and D3 are reversed for half the population

D2.

Suppose that you have to pay NOK 100 as an extra subscription if you do not participate in the dugnad. This is enough to pay professionals to do the job. Would you participate more often, more seldom or would it not affect your participation in the dugnad?

- a) Would participate more often
- b) Would participate more seldom
- c) Of no consequence

D3.

Suppose that you have to pay NOK 100 as an extra subscription if you do not participate in the dugnad. This is not enough to pay professionals to do the job. Would you participate more often, more seldom or would it not affect your participation in the dugnad?

- a) Would participate more often
- b) Would participate more seldom
- c) Of no consequence

### **Questions on recycling:**

Next are some questions on recycling. The activities we refer to are sorting, folding, cleaning and transportation of waste for recycling. Do not include waste that you sort for your own use such as paper used for your fire place and garden waste for compost.

K1.

Do you recycle all, most, some or none of:

- a) Drinking cartons
- b) Plastic apart from deposit returns
- c) Glass apart from deposit returns
- d) Metal apart from deposit returns
- e) Paper and cardboard
- f) Food waste/compost

Response alternatives:

All  
Most  
Some  
None

If only paper and cardboard and/or food waste/compost: go to question K4b

None on all: Go to question K9

K2.

Do you clean waste for recycling?

Yes

No

K3.

How do you usually clean the waste for recycling? In the same water as the usual dish wash, in separate hot or warm water, or in cold water?

1. In the same water as the usual dish wash
2. In separate hot or warm water
3. In cold water

K4.

How many extra minutes do you usually spend in an average week on:

- a) Cleaning waste for recycling
- b) Folding, sorting and carrying out sorted waste at home
- c) Transportation of waste for recycling to a recycling centre. Do not consider waste for deposit.

K5.

Assume that a recycling company can use your waste. A new technology makes it possible to sort the waste centrally such that the environmental effect will be the same. The company collects the waste unsorted at your home. Would you accept the offer of using the company if it would not increase your expenses, or would you prefer to do the recycling yourself?

1. I would accept the offer
2. I prefer to do the recycling myself → question K8

K6: THE POPULATION IS DIVIDED INTO 5 PARTS THAT ARE PRESENTED DIFFERENT VERSIONS OF THE QUESTION.

K6-a (1/5 of the population) Are you willing to pay NOK 50 per year to the company to let it take over the recycling the household does today? This amount will be additional to what you already pay in waste fees.

1. Yes
2. No

K6-b (1/5 of the population) Are you willing to pay NOK 150 per year to the company to let it take over the recycling the household does today? This amount will be additional to what you already pay in waste fees.

1. Yes
2. No

K6-c (1/5 of the population) Are you willing to pay NOK 250 per year to the company to let it take over the recycling the household does today? This amount will be additional to what you already pay in waste fees.

1. Yes
2. No

K6-d (1/5 of the population) Are you willing to pay NOK 450 per year to the company to let it take over the recycling the household does today? This amount will be additional to what you already pay in waste fees.

1. Yes
2. No

K6-e (1/5 of the population) Are you willing to pay NOK 600 per year to the company to let it take over the recycling the household does today? This amount will be additional to what you already pay in waste fees.

1. Yes
2. No

K7.



What is the highest amount you are willing to pay per year to the company to let it take over the recycling the household is doing today?

NOK per year:

K8.

Do you agree, partly agree, partly disagree or disagree in the following statements? I recycle partly because...

- a) I want to think of myself as a responsible person
- b) I want other people to consider me a responsible person

Change the succession of the questions so that half the population gets the question in the order a) b), and the second half in the order b) a)

- c) I consider it an imposition from the authorities
- d) It is a pleasant activity in itself
- e) I should myself do what I want other people to do
- f) I want to contribute to a better environment

Response alternatives:

- 1. Agree
- 2. Partly agree
- 2. Partly disagree
- 4. Disagree

K9.

K9-a (half the population) If you got new information that recycling is more important to the environment than earlier assumed, would you recycle...

- 1. as before
- 2. more or
- 3. less than before

K9-b (half the population) If you got new information that recycling is less important to the environment than earlier assumed, would you recycle...

1. as before
2. more or
3. less than before

K10.

Do you think recycling contributes to a better environment?

1. Yes
2. No → end questions on recycling

K11.

Assume that the municipality arranges for more recycling in homes. Recycling is voluntary. Which of the following statements do you mostly agree on?

1. It is good that the environment is taken more into account, but for me personally it is a disadvantage that more effort is expected
2. It is good that the environment is taken more into account, and for me personally it is an advantage that I now can increase my effort
3. It would not mean anything to me