



The price of warm glow[☆]

Andrew Lilley^a, Robert Slonim^{b,*}

^a The University of Sydney, Australia

^b The University of Sydney, Australia, and IZA, Germany



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ABSTRACT

This paper presents a model and experimental evidence to explain the “volunteering puzzle” where agents prefer volunteering time to donating money when monetary donations are, *ceteris paribus*, more efficient for providing resources to charity. In the model agents receive heterogeneous utility from pure and impure altruism (Andreoni, 1989) that permits warm glow to vary between monetary donations and volunteering, thus allowing preferences for impure altruism to rationalize inefficient allocation decisions. We define a measure of the price of impure altruism as the additional proportion of income contributed by a donor to give in the dimension that maximizes her utility, holding the overall charitable contribution constant. To test the predictions of the model we ran an experiment in which we varied *within-subjects* the costs and benefits of monetary and volunteer donations. We also varied *between-subjects* the emphasis on either the donation value to the charity (pure altruism) or the contribution of the donor (impure warm-glow altruism). Consistent with the model's predictions, the experiment shows that framing the donation decision from a pure perspective increases the efficiency of donation choices, the substitutability of donations between money and time, and crowding out. Nonetheless, while greater impurity results in a more inefficient allocation of resources, empirically we find that it increases overall charitable donations. We discuss the implications of our experimental results for both theory and policy.

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1. Introduction

Smith (1759) recognized the existence of altruism in economic behavior long ago, “How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it.” Becker (1974) more recently noted that the motives for charitable behavior that may appear pure could be strategic and selfish. Understanding the motives for helping others has many policy implications. For instance, Andreoni (1989, 1990, 1993) and Andreoni and Payne (2003, 2011) have argued that the extent of crowding out of charitable behavior depends on how much people are motivated by pure motives rather than impure warm glow motives (Andreoni, 1989).¹

Despite the importance of understanding the motives for charitable behavior, researchers have generally been unable to determine the *degree* to which people are affected by pure and impure motives. The

key difficulty is finding situations where the motives can be observed in isolation. The literature, however, does provide evidence of both pure altruism and warm glow. For instance, Tonin and Vlassopoulos (2010) compare the public good donations of agents by eliciting both pure and impure responses, and find that warm glow motivation is a significant motivator for volunteering (though only for women). Andreoni and Payne (2003, 2011) estimate the effect of crowding out of voluntary donations resulting from pure motivations and find that the crowding out coefficient ranges from 0% to 30%. Null (2011) shows that donors only respond marginally to matching donations, indicating that warm glow motives lead to inefficiencies in resource allocation.

Focusing on the relationship between monetary donations and volunteering time, the literature generally finds evidence suggesting that the utility from donations and volunteering are separable (e.g., Freeman, 1997; Bauer et al., 2012). One of the most common explanations is that the signaling effect differs between monetary donations and volunteering. For instance, Carpenter and Myers (2010) find that image concerns are a significant motivating factor among volunteer firefighters and Ariely et al. (2009) experimentally show that the visibility of a charitable donation has a significant effect on donor effort. Brown et al. (2013), controlling for signaling effects, experimentally examine the separable intrinsic warm glow of money and time donations. They find that subjects prefer giving ‘effort’ directly to charity rather than donating earned income. They posit that volunteering must have an innately stronger warm glow than monetary donations.

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* Corresponding author at: School of Economics, University of Sydney, 2006, Australia. E-mail address: robert.slonim@sydney.edu.au (R. Slonim).

¹ Dye (1980) was one of the earliest to study multiple reasons for volunteer giving.

In this paper, we introduce a new, more nuanced model of altruism, based on the existing empirical evidence and the theoretical work of Andreoni, Gale and Sholz (1996), in which agents have separable utility over pure and impure motives that vary across monetary donations and volunteering time. In the model, we solve for the optimal allocation of time and money an agent gives to themselves and charity. We then derive several comparative static predictions based on the optimal choice of money and time donations. The model predicts that the more agents are motivated by pure rather than impure altruism, the more they will (1) donate in a manner which is more efficient for increasing charity, (2) pay less for warm glow, and (3) suffer greater crowd out. The model also offers a comprehensive explanation for the volunteering puzzle (Handy and Katz, 2008).² The puzzle emerges whenever people volunteer time despite monetary donation being the more efficient method for providing the charity. To explain the volunteering puzzle, our model shows that agents are less likely to substitute away from volunteering towards the more efficient monetary donations the more they are motivated by warm glow.

To test the model's predictions, we ran a laboratory experiment in which subjects simultaneously allocated money and work time to themselves and a charity. All subjects were given 24 decisions that involved every combination of (a) three private wages, (b) two tax levels on the private wage, (c) two endowment levels and (d) two matching levels on monetary donations. These factors let us estimate for each subject a novel measure of inefficiency associated with donations motivated by impure altruism. We define this inefficiency measure, the *cost of impure altruism*, as the minimum amount of income we can be sure that a donor contributed solely to consume warm glow. This cost of impure altruism measure captures the loss in donations to charitable organizations as donors inefficiently allocate resources to satisfy warm glow rather than pure altruistic motives.

To examine the effects of pure and impure motives on crowding out and on the price of impure altruism, we varied both the use of a tax (to no one or to the charity) and framed their decision under either pure or impure altruistic motives. To make the laboratory environment reflect a natural environment, we partnered with both a small non-profit (to be the beneficiary of any monetary donations and volunteer work) and with a small private business (to pay a private wage for actual work). The work was identical for the non-profit and private business and involved addressing, folding and inserting a one page letter (for soliciting a donation for the charity and for customer appointments for the private business).

The experimental results support all of our model's predictions with respect to the comparative statics tested. The two most important predictions of the model were strongly supported. First, crowding was significantly larger when subjects' choices were framed under pure rather than impure motives. Second, the inefficiency in donors' allocation choices was significantly higher for subjects within the impure rather than the pure frame. We also find a significantly higher price of impure altruism among subjects in the impure rather than pure frame. Despite the higher degree of inefficiency, subjects gave more to charity overall in the impure rather than pure frame. This occurs because the impure frame motivated more overall charitable giving across both monetary donations and time volunteering. This result provides one reason why charitable organizations often do not attempt to make donors aware of the inefficiency in their choices.

The following two sections present the theoretical model, hypotheses and experimental design. Section 4 presents the experimental results and Section 5 concludes and discusses implications for future work and policy.

2. Theoretical model and hypotheses

We present a theoretical model that is motivated by the evidence and based in part on the model in Andreoni, Gale and Scholz (1996). In their model, agents derive utility from increases in the public good with separable utility over their warm glow from monetary donations and volunteering. We adopt the same approach, but also allow agents to receive separable utility over the value of their contribution to the public good (charity).

In our model, an agent who donates money and time to charity may receive three types of utility from their choice: 'warm glow' from their personal contribution of money, a separable 'warm glow' from their personal contribution of time, and a third separable utility over the provisioning of the public good. We extend the model to allow for two policy choices, matching donations from a third party and government provision of charity (financed by taxation). Consistent with the standard model (Andreoni, 1990), in our model if a third party offers to match an agent's donation of money one for one *ex post* to his donation decision, then the agent would *ceteris paribus* receive greater utility from the public good provision (increased by the match), but the match would not influence the agent's 'warm glow' utility since it did not change the agent's personal contribution.

We now define the agent's utility function and derive four central (comparative static) predictions that we will test in our experiment. Appendix A1 presents the technical proofs of the propositions and hypotheses.

2.1. Model description

Definition 2.1. A pure altruist is an agent who derives the value of donating to charity solely from the increase in value of the provisioning of the charity itself.

Definition 2.2. An impure altruist is an agent who derives the value of donating to charity solely from the warm glow effects from her personal donations of money and/or time.

Definition 2.3. A mixed altruist is an agent who derives the value of donating to charity both from the increase in value of the public good itself and the warm glow effects of their own contributions of money and/or time.³

The mixed altruist derives utility over her composite consumption good, x , the size of charity or public good, p , the warm glow from her monetary donation, q , and the warm glow from her volunteer time, r . We denote her utility from consumption U_x , from the size of charity U_p , and from the warm glow of monetary and time donations as U_q and U_r respectively. We describe her utility function with the following form:

$$u(x, p, q, r) = U_x \left[E - g + (H - h_v)(1 - t)w_p \right] + \beta U_p \left[P_{-i} + g(1 + m) + (H - h_v)t\lambda w_p + h_v w_v \right] + \alpha U_q [g] + \alpha U_r [h_v]$$

where E is the agent's monetary endowment, g is her monetary donation and m is a 'matching' donation rate (hence $\frac{1}{1+m}$ is the price the donor pays to increase the public good with a monetary donation but does not change the price of warm glow which is proportional only to

² The magnitude of the inefficiency in donations due to the volunteer puzzle may be very substantial. For instance, in 2010 approximately 26% of the US population volunteered time with an estimated value of \$173 billion (Independent Sector, 2010) and volunteer time is estimated to be worth over twice the value of monetary donations in Australia (ABS, 2006).

³ Our pure, impure and mixed altruist definitions correspond to Andreoni's (1990) pure altruist, pure egoist and impure altruist definitions, respectively. The term impure altruist reflects the utility derived strictly from the warm glow effects derived from private contributions of time and money, and the term mixed altruist captures the utility from both the pure and impure warm glow motives.

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