Working for "Warm Glow": On the Benefits and Limits of Prosocial Incentives

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Abstract

We study whether using prosocial incentives, where effort is tied directly to charitable contributions, may lead to better performance than standard incentive schemes. In a real-effort task, individuals indeed work harder for charity than for themselves, but only when incentive stakes are low. When stakes are raised, effort increases when individuals work for themselves but not when they work for others and, as a result, the difference in provided effort disappears. Individuals correctly anticipate these effects, choosing to work for charity at low incentives and for themselves at high incentives. The results are consistent with warm glow giving and have implications for optimal incentive design.

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1 Introduction

Designing incentive schemes to best motivate effort is an important design question for firms, governments and other organizations. Neoclassical economic theory predicts that individuals should excerpt more effort when compensation for performance is paid directly to them rather than to a charity. Money is a good and effort is costly; therefore, indirect compensation through charitable donations or gifts should be a less effective incentive than an equivalent direct monetary payment.

However, evidence from psychology (Deci, 1971) and behavioral economics (Gneezy, Meier and Rey-Biel, 2011) suggests that direct monetary incentives may not always be optimal in motivating performance, especially when the incentive levels are low. Suppose a company wants to motivate its employees to lose weight and can pay at most $5 per pound lost. Losing a pound is difficult and the extra $5 in purchasing power may not be motivation enough for individuals to lose the weight.

Alternatively, suppose that the company offered to donate $5 to a local charity for every pound lost. The pleasure derived from doing good for others every time the treadmill is used or unhealthy food is avoided may be greater than from equivalent direct compensation. In turn, these prosocial incentives could provide sufficient motivation for individuals to take the necessary steps towards weight loss. However, although prosocial incentives may be more effective when the amounts involved are small, would they still work harder for charity when the stakes increase—would people work harder for a $100 or $1000 donation rather than receiving the money directly?

This paper studies whether and when prosocial incentives—where charitable contributions are directly tied to effort levels—lead to better performance and greater effort provision than standard, self-benefiting incentives. We find that individuals indeed provide greater effort under prosocial incentives than under standard, self-benefiting ones when the incentive stakes are low. However, this difference disappears or reverses when the stakes are high. In addition, individuals seem to anticipate these effects and prefer to work for prosocial incentives when the stakes are low and self-benefiting ones when stakes are raised.

In a recent paper, Dunn, Aknin and Norton (2008) demonstrate that individuals report greater happiness when spending money on others than when spending on themselves. Bonuses in the form of charitable contributions were shown to increase employee happiness relative to paying the employee directly (Norton, Anik, Aknin, Dunn and Quoidbach, 2012). These findings suggest that, at least over some incentive levels, tying individuals' effort directly to charitable contributions may be a more effective motivator than standard incentives. While numerous lines of research have argued that individuals derive pleasure directly from prosocial behavior (Charness and Rabin, 2002; Loewenstein, Thompson and Bazerman, 1989), the theory of "warm glow" giving offers the most parsimonious framework for testing this intuition (Andreoni, 1988, 1989, 1990). According to the theory, individuals derive private value from the the altruistic *act* apart from the overall outcome provided for others.

In addition, studies have shown that introducing direct monetary incentives may not necessarily increase an individual's motivation to exert effort in a particular task. In some cases, introducing low self-benefiting incentives actually decreases performance relative to providing no incentives at all. Gneezy and Rustichini (2000) showed that, relative to no compensation, students scored worse on an IQ test when they were paid a small amount directly for their performance; Heyman and Ariely (2004) found a similar result in the case of neutral computer task. Drawing on these findings, we posit our first hypothesis (Hypothesis 1): a prosocial incentive scheme may both be preferred and result in better performance than a self-benefiting incentive scheme when the incentive stakes are low.

However, there is reason to suspect that the benefit individuals derive from charitable acts may be to some extent independent of the benefit for the recipients of the acts. In other words, people derive warm glow from giving, valuing the effort exerted for others rather than the benefit others receive from that effort. Andreoni (1993) offered support for this notion through an experimental test of the crowding-out hypothesis, which predicts that government contributions to a privately provided public good (e.g., a charity) should completely crowd out private contributions. The neutrality result presumes that purely altruistic individuals do not place a private value on the act of giving: if the government uses a dollar in taxes

for contributions to a charity, then the individual will reduce her voluntary contribution by a dollar while keeping the charity's revenue constant. The theory of warm glow giving makes an alternate prediction—that crowding out will be incomplete since individuals derive a private benefit from the act of personally giving. Andreoni used a modified public goods game to show that indeed crowding out was incomplete: when participants were taxed and taxes were contributed to the public good, they did not reduce voluntary contributions by the size of the tax. Total contributions were significantly larger when participants were taxed than when they were not, suggesting that individuals valued the act of giving apart from the overall impact of contributions.

Hsee and Rottenstreich (2004) provide further evidence of individuals' insensitivity to the benefits of the donation for others, showing that individuals are willing to donate the same amount for the rescue of one animal as for the rescue of four animals. This type of scope insensitivity is also shown by Small, Loewenstein and Slovic (2007), who demonstrate that individuals donate the same amount for one person as for 10 people (also see Linardi and McConnell (2011) for additional evidence of scope insensitivity in the social domain). In light of these studies, our second hypothesis (Hypothesis 2) predicts that effort under prosocial incentive schemes should display scope insensitivity—namely, effort provided should be independent of incentive stakes.

Self-benefiting incentives, on the other hand, may not exhibit the same scope insensitivity. As demonstrated by Gneezy *et al.* (2011), individuals under self-benefiting incentive schemes do respond positively to increases in incentive size once these incentives are already in place. Particularly, individuals already being compensated personally for their work will work harder when the payment stakes increase. The positive relationship between incentive size and effort under self-benefiting incentive schemes, in conjunction with the scope insensitivity under prosocial incentives, leads to our third hypothesis (Hypothesis 3): as the incentive size increases, individuals should both prefer and exert more or equal effort under self-benefiting rather than prosocial incentive schemes (provided the substitution effect exceeds the income effect).

We provide empirical support for these hypotheses using a novel experimental paradigm

where real, costly effort is tied directly to either self-benefiting or prosocial incentives. We first look at whether individuals exert more effort under a prosocial incentive scheme than under a self-benefiting one when incentive stakes are low, and study whether this difference disappears or reverses when stakes are higher. We then examine if individuals anticipate these effects: whether they choose to work for charity more often than for themselves when incentives are low, and if this choice reverses when stakes are raised.

Our findings are consistent with our hypotheses: individuals work harder for charity than for themselves under low incentives or when no explicit incentives are provided. Effort provided under prosocial incentives, however, is no longer greater than under self-benefiting incentives when the stakes increase. This is primarily driven by the fact that individuals work significantly harder when the amount they are paid is greater, as economic reasoning would suggest, but are generally insensitive to the scope of the prosocial incentive. This insensitivity to scope is consistent with pure warm glow giving. Particularly, the effort they exert for charity does not change as the payment stakes increase. In addition, individuals' choice of incentive scheme is consistent with their choice of effort provision: they choose to work for charity when stakes are low and for themselves when the stakes increase. This contrasts with the inconsistency between choice and reported well-being found in previous work (Dunn *et al.*, 2008).

2 Effort Experiment

We recruited 187 students from a university wide subject pool to participate in a 30 minute study. Participants were given a $5 show up fee and could earn more depending on the condition and effort exerted.

Each session had between 6 to 8 participants who were randomly assigned to isolated computer terminals. There was at least one empty computer terminal between each participant to ensure privacy. A computer program randomized conditions within each session, and all instructions were displayed on each participant's individual computer screen.[1] Par-

[1]The experiment was programmed using the Qualtrics Research Suite.

ticipants were asked to read the instructions to themselves and notify the experimenter if they had any questions. All questions were answered in private.

To measure effort, we asked subjects to squeeze a hand dynamometer that recorded force output in Newtons, twice. All participants were first asked to squeeze the device for 60 seconds to obtain a baseline measurement. The total force exerted was reported to the participants and acted as the baseline measure. Participants were then randomly assigned to one of five conditions in a 2 (For Self *vs.* For Others Incentives) $\times$ 2 (Low *vs.* High Incentives) between-subjects design, with an additional no incentive control condition.

After squeezing the hand dynamometer for 60 seconds to obtain a baseline measurement, participants were exposed to our manipulation. Participants were told that under the For Self incentive scheme (self-benefiting) they would receive the amount earned at the end of the experiment; the amount earned under the For Others incentive scheme (prosocial) would be donated to the Make-A-Wish Foundation (incentives are shown in Table 1). Each was then asked to squeeze the device again for 60 seconds after being matched into one of the 5 treatments: For Others and For Self incentive schemes were crossed with two incentive levels, Low and High. In the control condition, we simply asked participants to squeeze the device again for 60 seconds without giving them any explicit incentive to do so.

In the four incentive treatments, the amount earned by the participants or the charity was directly tied to effort. For example, participants in the For Self treatment under High incentives earned \$2.00 cents for every 25k Newtons of force exerted during the treatment stage. They were not directly compensated for effort during the baseline stage. Earnings based on effort in the two incentive levels ranged between \$0.02 and \$0.35 in the Low treatments and \$2.73 and \$12.34 in the High incentive treatments.

As our dependent measure of effort, we used the ratio R of total force exerted during the treatment stage to that exerted in the baseline stage, which provides a normalized measure of effort that aims to control for individual characteristics such as gender and physical fitness.

TABLE 1.
Treatment Summary

Treatment	Incentive (*per 25k Newtons*)	*N*	Gender (*% Male*)	Initial (*Newtons*)	*R*
For Others *Low*	\$0.05	38	39%	65,620	1.51
For Others *High*	\$2.00	40	55%	57,991	1.48
For Self *Low*	\$0.05	36	44%	68,450	1.14
For Self *High*	\$2.00	36	53%	59,598	1.74
Control	-	37	51%	64,836	1.07

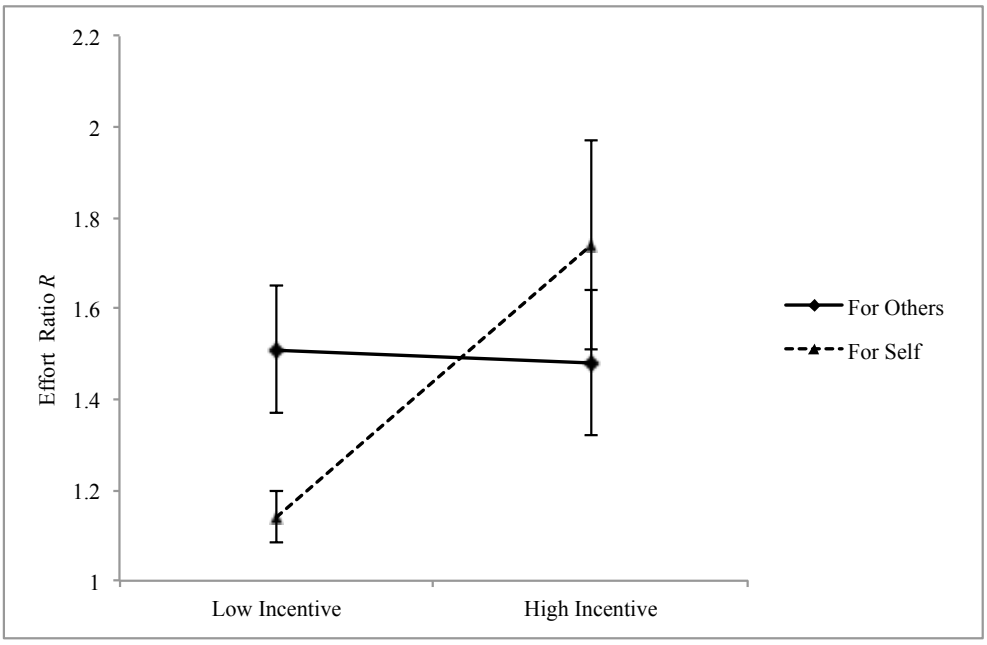
Results

Table 1 lists averages of initial exerted effort for each of the 5 treatments. A preliminary test on initial effort revealed no between-group differences in baseline force exerted, $F(4, 182)=1.01$, *ns.* Similarly, pairwise comparisons show no significant differences in initial effort ($p > .1$ for all comparisons), suggesting that effort at the baseline stage did not differ by treatment.

Table 1 also lists the gender composition in each treatment; pairwise comparisons reveal no significant differences in compositions ($p > .2$ for all comparisons). In addition, there was no significant difference in the gender composition between the two High treatments and the two Low treatments plus Control ($t(185)=1.20$, $p = .23$). Running an OLS regression of the effort ratio R on a gender dummy (Male = 1; Female = 0) revealed no significant relationship between gender and our main dependent measure of effort ($\beta = .09$, $p =.497$). There were also no gender differences in the effort ratio R *within* any of the treatments ($p > .3$ for all comparisons).

We first examined the effect of the 4 incentive treatments (For Self *vs.* For Others Incentives) × (Low *vs.* High Incentives) on effort. We predicted that at Low incentive levels participants would exert more effort For Others than For Self (Hypothesis 1), with this difference disappearing or reversing as the incentive size increased (Hypothesis 3). Consistent

FIGURE 1. Effort Ratio R by Treatment



with the first hypothesis, individuals indeed worked harder For Others (M=1.51, SD=.87) than For Self (M=1.14, SD=.34), $t(72)$=2.37, p =.020, when incentives were Low. However, in line with Hypothesis 3, the difference between incentive schemes disappeared when the incentive size was High, $t(74)$=.96, p =.338. Indeed, a joint hypothesis test revealed that effort For Self under Low incentives was significantly lower than in the other three conditions, $F(3, 182)$=2.86, p=.038 (see Figure 1).

We further predicted that participants' effort would respond positively to increases in incentive size under the For Self incentive scheme, but be insensitive to the scope of incentives when working For Others (Hypothesis 2). In line with our second hypothesis and traditional economic reasoning, participants exerted significantly more effort under the For Self incentive scheme when incentives increased from Low to High (M=1.14, SD=.34 *vs.* M=1.74, SD=1.36), $t(70)$=2.58, p =.012. However, the increase in incentives did not change the level of effort exerted under the prosocial incentive scheme (M=1.51, SD=.87 *vs.* M=1.48, SD=1.03), $t(76)$ = -.13, p =.896.

To see whether the difference in difference between incentive schemes was significant as the size of incentives went up, we ran an OLS regression of the dependent variable R on the

interaction between incentive scheme and incentive size. Our binary independent variables were the incentive scheme (For Others = 0; For Self = 1), incentive size (Low = 0; High = 1), and the interaction of the two. Neither incentive scheme (β = -.37, p =.107) nor incentive size (β = -.03, p =.898) had a significant influence on exerted effort. Importantly, however, we observed a significant interaction (β = .63, p =.049), suggesting that the relative effectiveness of prosocial incentive schemes is effected by the stakes involved.

Our control condition provided insight into the effectiveness of the incentive schemes relative to when no explicit incentives were provided. When no incentives were provided, individuals exerted less effort than under both prosocial incentive schemes, as well as under the self-benefiting incentive scheme when stakes were high (all $ps < .02$). However, when incentive levels were low in the self-benefiting incentive scheme, participants worked about as hard as when no incentives were provided (M=1.14, SD=.34 *vs.* M=1.07, SD=.29), $t(71)$=.90, p =.369. This offers further support for the notion that when incentives are low, prosocial incentive schemes may be superior to standard ones in motivating effort and performance.

To ensure that our results are robust to outliers, we conducted non-parametric permutation tests on the distributions of effort under the 4 incentive schemes. Using permutation methods, we constructed test statistics based on Schmid and Trede (1996) and conducted one-sided tests for stochastic dominance and *separatedness* of the distributions (see also Anderson, DiTraglia and Gerlach, 2011; Ditraglia, 2006). The test statistics identify the degree to which one distribution lies to the right of the other, taking into account both the consistency of differences between distributions (i.e. how often they crossed) and the magnitudes of the differences.[2]

The results of non-parametric distributional tests, p-values computed by Monte-Carlo methods with 10,000 repetitions, were consistent with the parametric tests above. We found a significant difference between the distributions of effort For Others and effort For Self under Low incentives (p =.027), as well as between the distribution of effort For Others and the control condition (p =.002). At High incentives, however, the distributions of effort For

[2]For the data and a full description of how these tests were constructed, see Online Appendix (https://sites.google.com/site/alexoimas/prosocialincentives).

Others and For Self did not differ (p =.279), and both were significantly different than the distribution of effort in the control condition (both $ps < .01$).

To further rule out that our results were driven by outliers, we re-ran the analyses while winsorizing R at the upper bounds of the 95% confidence intervals of the treatments, which were 1.79, 1.80, 1.25 and 2.21 under the For Others (Low, High) and For Self (Low, High) incentive schemes, respectively.[3] The results were robust to winsorizing the data: individuals worked harder for charity than themselves at low incentive levels ($t(72)$=3.24, p =.001), and this difference disappeared when incentives were raised ($t(74)$=1.32, p =.19). Winsorizing R at a constant value (e.g., 3) did not change the results.[4]

3 Choice Experiment

We recruited 57 students from a university wide subject pool to participate in this study. Subjects were given a $5 show up fee and could earn more depending on the condition and effort exerted.

Effort was measured similarly to Study 1. All participants squeezed the hand dynamometer for 60 seconds to obtain a baseline measurement and were informed of their initial force output. At the outset of the study, each participant was randomly assigned into one of two conditions: Low Incentives or High Incentives. They were then asked to choose one of two payment schemes, For Self (self-benefiting) or For Others (prosocial), prior to squeezing the device again for 60 seconds.

As in Study 1, effort exerted For Others benefited the Make-A-Wish Foundation and effort For Self was tied to payment received at the end of the experiment. Incentive under each condition are shown in Table 2.

[3]The maximum Rs under the For Others (Low, High) and For Self (Low, High) incentive schemes were 4.55, 6.49, 1.90 and 5.88, respectively.

[4]See Online Appendix for further robustness checks

TABLE 2.
Treatment Summary

Treatment	Incentive (*per 25k Newtons*)	*N*	Gender (*% Male*)	Initial (*Newtons*)	*R*
Low Incentives	\$0.05	30	37%	56,621	1.41
High Incentives	\$2.00	27	52%	64,387	1.37

Results

Averages of initial exerted effort for both treatments are listed in Table 2. A pairwise comparison revealed no significant difference in initial effort, $t(55)$=-1.00, *ns*. Gender composition did not differ by treatment, $t(55)$=-1.15, *ns*.

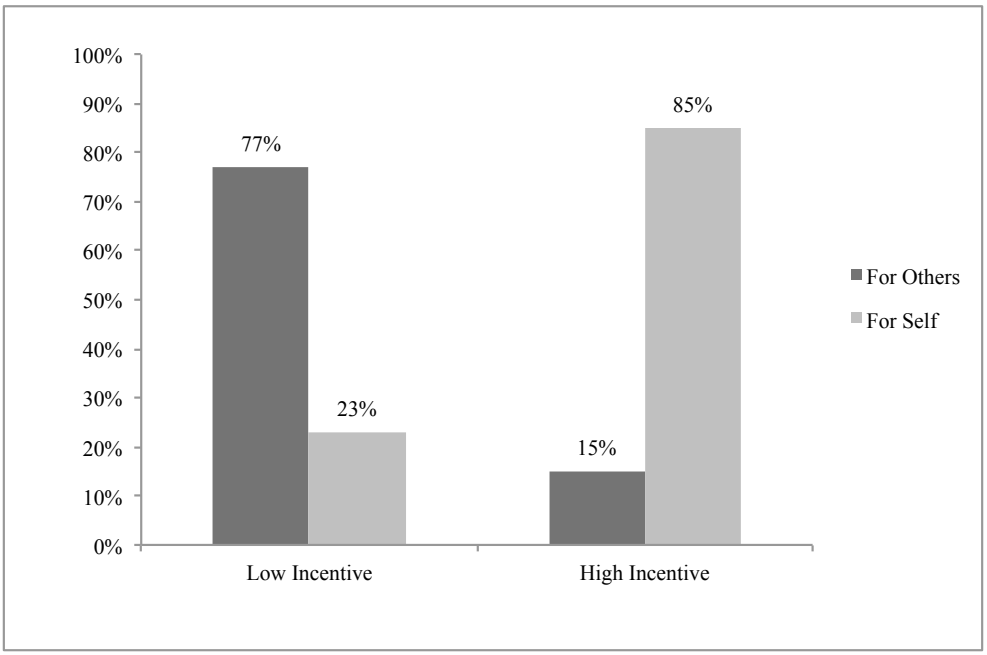
Our results suggest that individuals did indeed anticipate the benefits of prosocial vs. self-benefiting incentives as implied by Study 1 (see Figure 2). At Low incentive levels, 77% (23) of participants chose to work For Others, compared to 23% (7) who chose to work For Self. In contrast, at High incentive levels 15% (4) chose to work For Others, compared to 85% (23) who chose to work For Self. This difference was significant ($\chi^2(1) = 21.81$; $p < .001$).

Given the issues of selection in both incentive treatments, we cannot meaningfully compare the effort exerted by individuals under the two incentive schemes. Moreover, the resulting imbalance in cell sizes left these types of analyses severely underpowered. Nonetheless, results do appear to fit the general pattern outlined by our hypotheses, with the average R equaling 1.47 in the For Others condition versus 1.21 in the For Self when incentives were Low, and the same corresponding averages equaling 1.07 and 1.43 when incentives were High.

4 Discussion

Taking measured effort as a proxy for utility derived from the respective incentives, our findings suggest that individuals derive greater utility from prosocial spending than self-benefiting compensation, but only when the stakes are low. In addition, the utility derived

FIGURE 2. Percentage of Participants Choosing Incentive Scheme



is anticipated ex-ante: individuals *choose* to work for charity rather than themselves at low incentives, but prefer the opposite when stakes are raised.

Our results are consistent with a model of pure warm glow giving and help inform the literature on optimal incentive design. Traditional economic reasoning suggests that direct monetary payment will provide the strongest incentives. However, these self-benefiting monetary incentives have been shown to backfire, particularly when the payment stakes are low (Deci, 1971; Gneezy and Rustichini, 2000): monetary incentives may decrease prosocial behavior (Ariely, Bracha and Meier, 2009), reduce socially efficient contributions to a public good (Fuster and Meier, 2009), and result in lower effort provision than could be achieved with no payment scheme at all (Gneezy *et al.*, 2011; Heyman and Ariely, 2004). These findings suggest that there may be situations where direct monetary compensation is not the optimal incentive scheme to motivate individuals to exert effort.

Suppose that a company offers incentives to its employees to lose weight. Providing low direct compensation, e.g. $5 per pound lost, may not be enough to motivate individuals to adopt a healthier routine, and may in fact crowd out positive steps they were already taking. Indeed, recent evidence on the effectiveness of paying people directly for weight loss

has been mixed at best (Kullgren, Troxel, Loewenstein, Asch, Norton, Wesby, Tao, Zhu and Volpp, 2013). Our results suggest that prosocial incentives may provide stronger motivation for individuals to lose weight than "standard," self-benefiting incentives. Particularly, if the budget for a certain task or project is small, organizations should take advantage of the scope insensitivity of prosocial incentives by tying small charitable contributions to performance rather than compensating individuals directly.

Future research should explore whether making the contributions under a prosocial incentive scheme public or private has an effect on effort provision. Given the social signaling value of prosocial behavior, a prosocial incentive scheme may be even more effective in motivating individuals when effort-contingent contributions are public. In addition, since many employment contexts carry the expectation of direct compensation, it would be useful to compare the performance of individuals under a prosocial incentive scheme to when prosocial and self-benefiting incentives are mixed (Bracha and Brown, 2009; Tonin and Vlassopoulos, 2010, 2012).

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