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ABSTRACT

Social Image Concerns and Pro-Social Behavior*

Using longitudinal data on the entire population of blood donors in an Italian town, we examine how donors respond to an award scheme which rewards them with "medals" when they reach certain donation quotas. Our results indicate that donors significantly increase the frequency of their donations immediately before reaching the thresholds for which the rewards are given, but only if the prizes are publicly announced in the local newspaper and awarded in a public ceremony. The results are robust to several specifications, sample definitions, and controls for observable and unobservable heterogeneity. Our findings are consistent with social image concerns being a primary motivator of pro-social behavior, and indicate that symbolic prizes are most effective as motivators when they are awarded publicly. Because we do not detect a reduction in donation frequency after the quotas are reached, this incentive based on social prestige leads to a net increase in the frequency of donations.

JEL Classification: D12, D64, I18

Keywords: incentives, awards, public good provision, pro-social behavior, public health, social prestige

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1 Introduction

Motivating individual contributions to public goods and the performance of pro-social activities is a topic of increasing interest in Economics. These activities represent a substantial part of social life, as they include such actions as donating money for a cause or an organization, volunteering for a party during election times, cleaning beaches, or donating blood. In the US, for example, it is estimated that the dollar value of volunteer time is over $240 billion (Independent Sector 2006). Yet, for many of these activities, the supply is still below societal needs. Blood donations represent a prominent example of the diffusion of altruistic activities on the one hand, and on the insufficiency of the supply on the other.[1] Situations of shortage are the rule rather than the exception in most western countries, and even more so in developing nations.[2] This chronic supply shortage is worrisome for blood transfusions can be life-saving in some critical situations, such as massive blood loss due to trauma, blood replacement during surgical interventions, and to treat several chronic diseases, and there is no substitute available for human blood. In addition, surgical innovations such as organ transplants and the aging of the population are significantly shifting up demand. Neither eligibility criteria, nor a lack of information seem to explain why this supply shortage is occurring, since, for example, only 1/8th of eligible Americans (40% of the population) donate each year, and information campaigns, as well as communications about shortage periods (for example, during the summer season and around the holidays), are conducted with high frequency. This holds for many other pro-social activities as well.

An alternative cause left to be explored to understand what would lead people to increase the performance of pro-social activities concerns people's behaviors and incentives. Individuals might simply find it not worthwhile to dedicate time to pro-social activities if the benefits fall short of the opportunity costs. Or, just as documented for other domains, such as physical exercise or smoking cessation (DellaVigna and Malmendier 2006, Ashraf, Karlan and Yin 2006), potential donors may lack ability to commit. If these causes are relevant, then explicit incentives might be effective in increasing the number and frequency of donation by the eligible population.

A number of studies have investigated the impact of providing explicit incentives with eco-

[1] The Web site *BloodBook.com* reports that more than 16 million units of blood are annually collected in the United States. The Italian Association of Blood Donors (Associazione Volontari Italiani del Sangue: AVIS) has collected about 2 million units of blood in 2006 (AVIS 2007), and forty-four percent French declare to have donated blood at least once (Healy 2006).

[2] In the US, the American Red Cross and other organizations collecting blood need to have, at each point in time, the blood necessary for three days of demand at each location and for each blood type, but this target is seldom met, especially for rare blood types (including 0 negative, which is the universal donor and therefore particularly precious). Moreover, it is estimated that worldwide, there is currently a shortage of about 22 million units of blood (HemoBiotech 2008).

nomic value on the contribution to public goods. On the one hand, a few findings indicate a positive impact of material incentives. For example, Goette and Stutzer (2008) find that blood donors are attracted by the possibility to participate in a lottery at a drive. They find, however, also some evidence of "adverse selection" in the quality of blood. Lacetera and Macis (2008) find that the legislative provision that guarantees a paid day off work to Italian blood donors does lead to an increase in donation frequency. This raises the question, however, whether the increase in frequency more than compensates the cost for the Government to reimburse employers for the missed hours by donors-employees. Meer and Rosen (2008) show that selfish considerations can emerge also when explicit incentives are not present, since alumni at a research university increase their donations as their children approach college age and are positively affected by whether their children actually apply to that same university.

On the other hand, several empirical studies as well as theories have pointed out that material incentives can backfire. Edward Deci and his collaborators found that adding explicit rewards for the performance of activities which are originally motivated by intrinsic reasons leads to a reduction in the performance of those activities (Deci 1975). More recently, similar findings have been obtained by, among others, Frey and Oberholzer-Gee (1997) and Gneezy and Rustichini (2000). Mellstrom and Johannesson (2008), finally, find that Swedish female college students are less willing to undertake a health test in order to be able to donate blood afterward, if they are offered monetary incentives. The authors interpret their results as consistent with the claims of Titmuss (1971), although no crowding-out was detected among males. Benabou and Tirole (2006) have formalized these effects in a model where individuals perform altruistic activities to increase their social reputation and self-respect. The introduction of economic rewards creates doubts about the true reason behind pro-social behavior, thus potentially crowding out intrinsic motives. These claims are consistent with diffused opinions among several charitable organizations as well as legislators. Organizations such as the Red Cross prohibit paying donors in cash or even pre-paid cards, while small in-kind and symbolic rewards can be offered to donors. The performance of many activities is voluntary and unpaid by law in certain instances, as in the case of blood donation in most Western countries. The voluntary nature is expected to discourage low-quality contributors who would be attracted only by the extrinsic reward, and to not crowd out the intrinsic motives to contribute.

Other scholars, however, have advanced the idea that other forms of explicit incentives, such as symbolic awards, can increase the motivations to perform pro-social activities without the drawbacks from more material forms of payment. For example Frey and Neckermann (2008) claim that, unlike explicit payments, symbolic awards may be less costly, create a special rela-

tionship between the awarding and awarded parties, and increase the self-esteem, social status, and social recognition of the receiver, while monetary rewards can instead send a "bad signal" (to society and to one's own self) about the real motives behind the performance of a given activity. If this is true, then symbolic awards can emerge as both effective and efficient means to encourage pro-social behavior.

In this paper, we assess the impact of symbolic awards on the performance of pro-social activities, and investigate what characteristics of these awards appear to influence behavior the most. Specifically, we ask the question: Are symbolic rewards attractive *per se*, or is it the social prestige attached to receiving an award that matters? To answer this question, we analyze the effects of a symbolic award scheme put in place by the Italian Association of Voluntary Blood Donors (AVIS). The Association gives symbolic awards (medals) when a donor reaches certain donation quotas. One crucial feature of this scheme is that some of the prizes are assigned privately, while others are awarded in a public ceremony, and the names of the recipients are published in the Association's Bulletin and in the local newspaper. This peculiar feature of AVIS' award scheme gives us a unique opportunity to understand what characteristics of the awards actually affect donors' behavior, thereby shedding light on the actual motivations behind blood donation, and altruistic behavior in general. If donors respond to the presence of an award, and the response is due to such motives as the attachment to the Association as represented by the medal, self-esteem, or, say, by a "competitive drive" to receive the award, then we should not observe any difference in the response to private and publicly assigned awards. If instead, donors are attracted by the increase in social prestige deriving from reaching a certain donation quota, then donors should respond positively only to the public awards.

Our study is based on a unique, hand-collected, longitudinal dataset comprising the whole individual histories of blood donations of the entire population of donors in an Italian mid-sized town (The Town hereinafter) between 2002 and 2006.[3] The analysis shows that blood donors react to the symbolic award incentives by increasing their donation frequency, as the donation thresholds to receive one of the awards approach. The change in behavior, however, is substantial in magnitude and statistically significant (across multiple econometric specifications) only in proximity of those awards which are publicly given. The reduction in the lag between two donations when the "public award" approaches is as high as about 30% just before the threshold is reached, and is not followed by an ebb in donation frequency once the threshold is reached. The social prestige attached to being a repeat donor could, therefore, function as an effective incentive to increase the supply of blood.

[3] To protect the privacy of the donors in our database, we have agreed to keep the name of The Town (as well as any other identifying information) confidential.

The findings in this paper are consistent with a number of economic theories and some anecdotal evidence on the role of social prestige concerns for the performance of pro-social activities and the provision of public goods (Harbaugh [1998a, 1998b], Benabou and Tirole 2006, and Polborn 2007), as well as with claims advanced by scholars in other disciplines (Goode 1978, Wedekind 1998, Nowak and Sigmund 2000, Price 2003). Systematic empirical evidence on the impact of social image concerns is scant, however. Notable exceptions are represented by a few recent experimental studies. Ariely, Bracha, and Meier (2008) find that their experimental subjects would type faster on a keyboard, when the typing speed is associated to donation to "good causes" and the subjects' performance is publicized. Similar results are obtained when subjects are asked to cycle on a stationary bike. Neckermann and Frey (2007), in an experiment within a corporate setting, find that awards given to workers who contribute to a public good are more effective – in terms of the expressed intention of the subjects to contribute to the public good – when the awardees are made public.

In addition to offering evidence from a novel and unique data source, our analysis complements and adds to the existing literature in a number of ways. First, we analyze a naturally occurring reward system, and we study its impact on the actual behavior of donors, thus addressing the concerns expressed by a few scholars on the external validity of laboratory experiments. In particular, Levitt and List (2007) suggest that subjects might exhibit stronger moralistic and pro-social behavior in laboratory settings, where they might feel that their behavior is being highly scrutinized (see also List 2006 and Lazear, Malmendier and Weber 2006). To the best of our knowledge, our study is the first to present econometric work on an actual award scheme in the context of blood donation and of pro-social activities more generally. Second, we base our study on the whole population of blood donors of a given town, therefore we rely on a larger and more representative sample.[4] Third, the longitudinal nature of our data allows observing the same individuals multiple times, thus allowing us to control for observed and unobservable individual heterogeneity.

By quantifying the impact of social image concerns on the performance of an activity with major health and societal implications, this study also provides insights to charitable organizations and to policymakers. Charitable organizations might learn about the aspects of their rewards that are more effective in attracting donors, and in particular the publicity of these

[4] Most experimental studies use college students as subjects of laboratory and field experiments, and relatively gender-balanced samples. At least for the case of blood donations, individuals under the age of 25 represent only a small portion of the population of donors, and not necessarily a representative one, and women are only one-quarter of the population of donors. In the data used in this paper, for example, the average donor is 37 years old, donors younger than 25 are less than 10 percent of the sample, and only about 20 percent of new donors are younger than 25. The average donor is about 40 years old in the United States and most other European countries.

rewards since it boosts an individual's social image. Policymakers will learn about the effects of public subsidies to organizations providing public goods and pro-social activities, on the incentives by private individuals to contribute as well. A vast literature has investigated whether private contribution would be crowded out by public subsidies (Andreoni [1990, 1993], Andreoni, Harbaugh and Vesterlund 2007). If a major motive for pro-social behavior is social prestige, then public interventions should not crowd out, and would instead add to private contributions.

The remainder of the paper is structured as follows. Section 2 describes the institutional context of this study, and the particular award scheme of interest. Section 3 describes the data and outlines our hypotheses and empirical strategy. The empirical findings are reported in Section 4, and Section 5 offers a discussion and concluding remarks. All tables and figures are gathered in the Appendixes.

2 Blood Donation in Italy and in The Town

The data in this study originate from hand-collected information on the whole blood donation histories of all donors in an Italian town ("The Town" hereinafter) located in the Center-North of the country from 2002 to 2006. The demographic, social, and economic characteristics of The Town's population are highly representative of the overall Italian urban population.[5] Before describing the data in detail, we report on the blood donation system in Italy and in The Town.

Blood donation in Italy is organized through blood banks, which are run by voluntary donor associations. These associations have a central headquarter as well as local units. In order to donate blood, an individual is required to become a member of one of these associations. The three major associations, which are present in different parts of the country and do not compete with one another, are *Associazione Volontari Italiani del Sangue* (AVIS), with about 1.1 million members in 2007, *Federazione Italiana delle Associazioni Donatori di Sangue* (FIDAS), with about 400,000 members (Caligaris 2007), and *Fratres* (150,000 members in 2000).[6] Since the affiliation is to a local unit of the national associations, blood donors predominantly donate in the town where "their" unit is located. In The Town, blood donation is managed by the local unit of the largest blood donor association, AVIS, and aphereses of either whole blood or blood's

[5] Statistics comparing the Town with other Italian towns under a number of socio-economic characteristics are available upon request.

[6] Blood donations run through blood banks and voluntary donor associations (which were present since the 1920s) have become the official blood donation and collection system in Italy, after a brief period, following the end of World War II, when the Red Cross played a prominent role. Similar blood bank systems exist in other countries, such as Denmark, Greece, Norway, Portugal, and Spain. In the UK, France, and Ireland, by contrast, the organization of blood donation is run by the State. The Red Cross, finally, is the dominant organization managing blood donation in such countries as Belgium, The Netherlands, Germany, and the US. In the US, however, the system is more heterogeneous and competitive, comprising the Red Cross, blood banks, and hospitals directly managing blood donations. See Healy (2006) on the different organizational modes of blood donations.

components (plasma, platelets) are performed at The Town's public hospital, Monday through Saturdays from 8 to 11 a.m.

The Italian law sets limits to the frequency of donations of blood and blood products. Whole blood can be collected once every 90 days from male donors and once every 180 days from females (the differential treatment of females was introduced only in 1990). Donors can give platelets once every 30 days and plasma once every 14 days. Donations of blood components have shorter recovery time (at the hospital and between donations), but take longer to be performed. The time required for a platelet or plasma donation is about one hour, against an average of twenty minutes for a whole blood donation. Including the time to reach the donation site, the waiting time before the donation and the resting time at the hospital after the donation (which is higher for whole blood donation), on average a donor should expect a commitment of about two hours.

2.1 Rewarding and Recognizing Donors though Symbolic Awards

AVIS has established a series of symbolic awards for frequent donors, as a way to express gratitude for their activity, and, presumably, to motivate all donors to continue donating in a regular fashion. When a donor reaches certain thresholds in terms of number of donations, (s)he is awarded with such prizes as diplomas, medals, and pins. The thresholds to receive the various awards are fixed at 8, 16, 24, 50, 75 and 100 donations since joining the Association. Donations of whole blood, plasma or other blood products all count equally toward the awards. Furthermore, while the recipients of the awards associated with the 8th, 16th, 24th are notified and awarded "privately" (they pick up their medals at the Association's local office), when a donor reaches the 50th, 75th and 100th donation (s)he is rewarded in a public ceremony held once every two years, and his/her name is published in the local newspapers and in the Association's bulletin. Table 1 presents the awards, the accumulated donations required to win them, and the fraction of donations corresponding to awards in the years 2002 to 2006.

[Table 1 about here]

Figure 1 shows an article from a local newspaper, reporting on the latest award ceremony, and Figure 2 displays an actual AVIS membership card. The AVIS membership card reports the date and type of each donation made by the donor, which allows donors (and the Association) to verify whether the required interval between donations has been met, and to keep precise track of the cumulative number of donations made to date.

[Figure 1 about here]

[Figure 2 about here]

3 Data, Hypotheses, and Empirical Strategy

Using both AVIS' and the hospital's archives, we identified all of the Association's members from 2002 to 2006, for whom we obtained the entire donation history (of whole blood or blood components) over this period and the total number of past donations (as of 12/31/2001). We were able to record a number of individual variables over time. Information includes sex, age, blood type, and the date when each individual became an AVIS member and therefore began to donate blood. Table 2 presents descriptive statistics on the donors. Over the five-year period covered by our data, 2,009 unique individuals have donated blood in The Town, about 30 percent of whom were females. Over 14 thousand donations were made in the period 2002-06. The median donor is 37 years old and made 6 donations in the sample period. Of the donors who were already active as of 12/31/2001, half had been members of the Association for at least 7 years and made at least 14 donations before 2002.

[Table 2 about here]

Our data allow us to sort the donations of each individual and to compute the elapsed time (in days) between consecutive donations, which will be our key dependent variable. If donors care about receiving symbolic awards, we might observe them speeding up their donations, as the thresholds for receiving these awards approach. If, in particular, donors care about their social image associated to reaching a quota, then we would observe donors speeding up as the thresholds granting public awards are approached. The speeding might be concentrated right before a threshold is reached, if donors become aware of approaching the threshold as they get close to it. Since the time between two donations is, by law, relatively long, it is implausible to assume that donors have a "full donation plan" ex ante, thus progressively reducing the elapsed time between donations over a large number of donations. In addition, donors might develop a habit, such that if they speed up as the threshold approaches, they might keep a lower interval between donations after the threshold is reached. Conversely, instead of developing a habit donors might return to their average spells once a threshold is reached, or even slow down their donation frequency especially when the distance between consecutive thresholds increases.

The analysis below tests the hypotheses just stated. The characteristics of the data, and in particular the richness of observable characteristics for which we can control and the longitudinal nature that allows us to observe the same donor multiple times, play a key role in our effort to identify the impact of awards in general and social image concerns in particular. A finding that donors speed up as they approach a reward threshold may not imply a causal impact of social image concerns on donation behavior, unless a number of factors potentially correlated with

donation frequency are accounted for. These factors might include sex, age, the number of past donations, as well as the type of donations an individual does – whole blood, plasma, or platelets – since the required minimum amount of time between the previous donation and the current one varies with the type of the current donation.[7] Perhaps more fundamentally, individuals might differ in their unobservable donation attitudes. For example, donors with many donations might have a long "donor tenure" just because they let shorter time pass between donations; if we observe a reduction in the elapsed time between donations when donors are closer to the public award thresholds, this might just be the case because the donors who actually reach a higher number of donations are those who donate more frequently, regardless of the presence of awards, and for reasons unrelated to social recognition, such as their sheer generosity. In the analysis that follows, we do control for observable characteristics of donors, and also exploit the longitudinal nature of our individual donation data to control for donor fixed effects.

Note, finally, that the incentive scheme of our interest resembles multi-period, non-linear incentive plans sometimes observed in employment relationships and in education, where payments or high grades are obtained when certain quotas are reached or are restricted to a small number of participants (Asch 1990, Oyer 1998, Oettinger 2002). In the context of charitable giving, Meer and Rosen (2008) study the contribution of alumni to their university, and the effect of an "implicit" multi-period, non-linear incentive as represented by the approaching of the college age by the alumni's children and whether they have applied to that same university. All these studies assess changes in behavior as the thresholds to enjoy a particular reward or bonus approaches, and we follow a similar strategy in our attempt to identify the presence of social image concerns.

4 Empirical Analysis

4.1 Awards' Visibility and Donation Lags: Descriptive Evidence

Table 3 reports information on the elapsed time between consecutive donations. Overall, the average and median intervals are 158 and 119 days, respectively. As noted above, donors are required by the law to wait at least 90 days (for males, 180 for females) between two whole blood donations, 30 days for platelets and 14 days for plasma. The second panel of Table 3 reports statistics for male donors only, and the third panel shows information about male donors who

[7] Conversations with doctors and AVIS officials in The Town revealed that the type of donation is "exogenous" to a donor's choice. Donors, in general, join the Association to donate whole blood, and are assigned to donating blood components if they are not eligible to donate whole blood (e.g., if they have insufficient iron in their blood), or if there is some urgent need for a blood component. As a consequence, it is highly implausible that donors shift types of donations toward more "frequent ones" (e.g., shift from whole blood to platelets) as the awards thresholds approach.

always donate whole blood. For donations of whole blood by male donors, the average and median intervals are equal to 190 and 141 days, respectively. Both in the whole sample and in the sample restricted to the donations of whole blood by male donors, average and median lags immediately before the donation before the one leading to being granted a private reward (7th to 8th, 15th to 16th, and 23rd to 24th) are quite similar to the overall values. In contrast, the elapsed times for the donations leading to the public awards (49th to 50th, 74th to 75th, and 99th to 100th) are sizably shorter: Average and median spells are 109 and 98 days for all types of donations, and 138 and 119 for the donations of whole blood by male donors. Since the minimum lag between two whole-blood donations is 90 days, the average reduction in the "effective" time elapsed between donations of whole blood is from 100 days (i.e., 190-90) to 48 (i.e., 138-90) – a 50% reduction.

Figure 3 shows the entire distributions (c.d.f.) of elapsed days between consecutive donations for donations corresponding to no award, donations leading to a private award, and donations leading to publicly recognized awards. In Figure 4 we repeat the same exercise while isolating male whole-blood donors and reporting the distributions of "excess" intervals (i.e., elapsed days minus the 90 days required by law). While the distributions of the no-award and the private-award intervals do not appear to be too different from one another, the distribution of the public-award intervals is ostensibly shifted to the left.

[Table 3 about here]

[Figures 3 and 4 about here]

4.2 Awards' Visibility and Donation Lags: Regression Analysis

Following the discussion in Section 3 above, our regression analyses will estimate various specifications of the following empirical model:

$$Elaps_{i,n,m,t} = \alpha + \beta_1 Award_{i,n}^{Private} + \beta_2 Award_{i,n}^{Public} + \beta_3 Z_{i,t} + \gamma_t + \mu_m + \delta_i + \varepsilon_{i,n,m,t}. \quad (1)$$

In Model (1), $Elaps_{i,n,m,t}$ is the elapsed time (in days) between individual i's $n-1$th and nth donations, $Award_{i,n}^{Private}$ is a dummy variable equal to 1 if donation n is the 8th, 16th, or 24th donation and zero otherwise, $Award_{i,n}^{Public}$ is a dummy variable equal to 1 if donation n is the 50th, 75th, or 100th donation and 0 otherwise, $Z_{i,t}$ is a vector of (possibly individual-specific and time-varying) control variables, γ_t and μ_m are vectors of year and month dummies respectively, and the error term is composed of an individual-specific component δ_i and a "white noise" $\varepsilon_{i,n,m,t}$.

Table 4 reports the results of four specifications.[8] The main coefficients of interest are β_1 and, especially, β_2: they represent estimates of the changes in the donations lag in correspondence of private and public rewards respectively, as compared to any other donation. Columns (1), (2), and (3) report results from ordinary least squares regressions, and column (4) reports the coefficient estimates from fixed-effects regressions. In the first column, the specification includes, as controls, sex, age categories, year fixed effects, month fixed effects, and an indicator for whether a donation is of plasma or platelets. The coefficient estimate on $Award^{Private}$ is negative but small and statistically insignificant, while that on $Award^{Public}$ is negative, quite large in magnitude and strongly statistically significant. In column (2) we include among the controls the number of past donations made by an individual, as well as a vector of "cohort" indicators, i.e., dummy variables for the year each donor joined the association. We do so in order to control for heterogeneity across donors as well as for possible changes in donation patterns over time. In column (3) we also include an indicator variable for donations above the 50th, to further control for the possibility that the "public award" dummies are just capturing a selection effect, with more frequent donors being the ones letting shorter time pass between donations, regardless of the presence of awards. In column (4), finally, we estimate the same model as in column (3) with the addition of individual fixed effects. The OLS and fixed-effect regressions yield qualitatively similar results; the estimates on the public award dummy are attenuated (though still significant), moving from -46 to -27 in the fully specified models (3) and (4). The attenuation confirms the importance of accounting for individual observed and unobservable heterogeneity. Remarkably, the coefficient on the "public" award variable is always substantially (and significantly) larger than that on the "private" award. In the fixed effects specification, the coefficient on the "private" awards dummy is only marginally significant, while that on the "public" awards dummy remains sizable and strongly statistically significant. Overall, these results strongly confirm the descriptive evidence presented above, with a sizable response of donors to the opportunity to receive public recognition when such an opportunity is within close reach.

[Table 4 about here]

[8] In the analyses reported here, the elapsed time between donations enters in levels. Regressions with the natural logarithm of $Elaps_{i,n,t}$ as the dependent variable (performed so as to assess the relative impacts and to make sure the results are not driven by outliers), not reported here, yield qualititively similar results in terms of both the signs of coefficients and their statistical significance.

4.2.1 Additional Analyses and Robustness Tests

Below we report a series of additional analyses that further investigate the nature of the drop in donation lags around the public award threshold, and to reinforce the identification of the impact of social image concerns on blood donation behavior.

First, we assess whether the change in donation lags occurs only in correspondence of the single donations that entitles to the award or whether donors, instead, progressively reduce their lag as they approach the symbolic-award thresholds. We also investigate whether donors build a habit of more frequent donations, thus keeping lower lags in future donations right after they reach an award threshold. Column (2) of Table 5 reports estimates from a regression similar to that of Table 4, column (4) above, with the difference that dummies for the two donations before, and the two donations after the donations giving right to the symbolic awards are added among the controls. The result of this exercise indicates that the main effect is focused on the "critical" donation: Donors do not seem to form a habit, nor do they start reducing their lags beforehand.

Second, we exploit a further institutional characteristic of the social incentive scheme devised by AVIS in The Town, namely the fact that the biennial ceremony where the public awards are given and the names of the awardees are revealed takes place every other year in the month of February. In the period covered by our data, the ceremonies occurred in the month of February of the years 2002, 2004, and 2006. If donors reduce their donation lags in proximity of the public award thresholds because they care about social reputation, then one might see an additional "speeding" when the public ceremony approaches. In Column (3) of Table 5, we run our fully specified fixed-effect regression, adding interaction terms for whether the nth donation is at a threshold, and it occurs on the month of the ceremony, one month earlier, two, three, or four months earlier. Our results are suggestive of some "ceremony effect," albeit limited to the month when the ceremony is supposed to take place. Our results indicate that the lag between donations is further reduced (from about -28 to about -61, and the difference is statistically significant at the 5 percent level of confidence) if the threshold donation falls in the month when the ceremony is supposed to take place. Donors, therefore, appear to be more eager to make the crucial donation as the ceremony approaches.

[Table 5 about here]

Third, in columns (1) and (2) of Table 6 we estimate a version of model (1) with a full set of controls, fixed effects, and with dummies for each single threshold as opposed to just distinguishing between the set of private and public awards. The sign of the estimated coefficients

is negative, with only the coefficient on the dummy for the 50th donation being statistically significant. This is interesting, because the 50th donation threshold is the first one to give public recognition, and this can explain why donors seem to be particularly responsive to it.[9]

Finally, in columns (3) and (4) of Table 6 we report the results of analyses limited to two subsamples: all donations by male donors, and the donation of whole blood by male donors. Focusing on whole blood donations by male donors, in particular, provides us with a more homogenous (and large enough) sample that allows us to analyze the magnitudes of the estimates. In column (4), to further address potential selection issues not fully addressed by donor fixed effects, we restrict the sample to only include male donors of whole blood who eventually will reach at least 50 donations. Doing so reduces considerably the number of donors and observations, but it does not affect the magnitude or the statistical significance of our coefficient of interest. Once we fully control for observables and unobservable, time-invariant characteristics, the reduction in the donation lags in proximity of the private rewards is not significant (or only marginally significant), while the estimated reduction in the donation lag at the 50th award threshold is statistically significant, with a magnitude of 26 (column 3) to 28 (column 4) days. Considering that the average whole-blood donation lag by male donors is 190 days and that the minimum legal lag is 90, the estimated actual reduction in whole blood donation lags is about 30% – a substantial percentage.

[Table 6 about here]

All in all, these additional exercises reinforce the claim that donors respond to social image concerns.

5 Concluding Remarks

In this paper we have documented that the performance of pro-social activities is responsive to the social prestige attached to these activities. Using longitudinal data from the whole population of blood donors in an Italian town, we have found that donors accelerate their donation frequency as their "tenure" gets closer to thresholds at which the blood donors' Association (AVIS) confers symbolic rewards to repeat donors, but this acceleration is concentrated right before the quotas for which the rewards are publicly announced in the local community. The reduction in the lag is substantial, and is not followed by an ebb in frequency after the thresholds are reached. Social image concerns, therefore, may serve as a mechanism to increase blood supply and to reduce the frequent cases of shortage.

[9] In addition, note from Table 1 that only a handful of donors make it to the 75th and 100th donations, therefore regressions might just lack enough power to identify any response at higher thresholds.

This paper offers a contribution to the literature on the relationship between intrinsic and extrinsic incentives in the performance of pro-social activities and the contribution to public goods, by showing that extrinsic incentives without direct economic value also might increase these activities, especially if social recognition is attached to these rewards. The contribution to this literature is also methodological, since we add evidence from a natural setting to the current evidence based on controlled lab and field experiments, and the longitudinal nature of the data allows controlling for individual heterogeneity. Our study also contributes to a recent empirical literature on the behavioral effects of awards in general. As pointed out by Neckermann and Frey (2007), awards are broadly used in a variety of contexts, but have not been investigated by economists in depth. We document that, at least in the case of pro-social behavior, an important component of these awards is their publicity, so that awardees can boost their social image.

A major implication of our findings is for charitable organizations: In their decisions on how to incentivize and reward their contributors, these organizations should consider the positive response to public recognition as a potentially strong (and cost-effective) motivator. If the social-image component of symbolic rewards is a driver of altruistic activities, however, a "too high" number of these rewards, e.g., in terms of how often they are given to contributors and to how many contributors they are given, might dilute the social prestige attached to being publicly known as a frequent donor. The so-called "snob effect" that a number of studies have analyzed on the demand side for certain products (Leibenstein 1950, Pesendorfer 1995) might be present on the supply side also, especially for activities carrying a social-image impact. A challenge for charities is, therefore, to devise the optimal structure, in terms of quantity and frequency, of public rewards for their contributors.

A further implication is for public policies aimed at stimulating the voluntary contributions of citizens to public goods. If individuals have private motives to contribute to public goods beyond "pure altruism" (Andreoni [1989, 1990]), then public contributions should not result in a net crowd out of private contributions.[10] The quest for social prestige that we found as having a significant impact on pro-social behavior is one of these private motives, therefore public interventions such as matching private contributions of subsidizing charitable organizations might indeed increase the provision of these public goods.

[10] On the possibility of "private" motivations for giving, see Andreoni (1989, 1990, 1993), Vesterlund (2006), and Andreoni et al. (2007).

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A Tables

Award	Required Accumulated Donations	All donors		Males		Males, Whole blood only	
		N	percent	N	percent	N	percent
"Merit Certificate"	8	394	2.75	286	2.56	121	2.48
"Bronze Medal"	16	290	2.02	213	1.91	105	2.15
"Silver Medal"	24	207	1.44	160	1.43	79	1.62
Total "private" awards		**891**	**6.21**	**659**	**5.9**	**305**	**6.25**
"Golden Medal"	50	67	0.47	61	0.55	24	0.49
"Golden Pin"	75	38	0.26	35	0.31	11	0.23
"Golden Cross"	100	21	0.15	21	0.19	9	0.18
Total "public" awards		**126**	**0.88**	**117**	**1.05**	**44**	**0.9**
Total awards		1,017	7.12	763	6.98	763	6.98
Total donations (2002-2006)		14,351	100	11,165	100	10,926	100
Unique donors (2002-2006)		2,009		1,425		856	

Table 1: Awards, donation thresholds to achieve them, and their frequency in the data, 2002-2006. The category "Males, Whole blood only" includes only male donors who always donate whole blood.

Donors

Variable	Mean	Std. Dev.	Min	Median	Max	Obs
Fraction female	0.29					2,009
Age	37.45	10.84	18	37	65	2,009
Years in the sample	3.20	1.54	1	3	5	2,009
Donations in the period 2002-06:						
All donors	7.14	6.01	1	6	47	2,009
Males	7.84	6.38	1	6	47	1,425
Females	5.46	4.60	1	4	31	584
Average number of donations per year						
All donors	2.23	1.40	1	2	12	6,422
Males	2.33	1.44	1	2	12	4,783
Females	1.94	1.22	1	2	9	1,639
Information as of 12/31/01:						
Years active (all donors)	5.13	7.29	0	2	38	1,937
Past donations (all donors)	13.29	20.92	0	4	145	2,009
Years active (donors active as of 12/31/01)	9.07	7.63	1	7	38	1095
Past donations (donors active as of 12/31/01)	22.17	23.46	0	14	145	1,167

Donations

Variable	Mean	Std. Dev.	Min	Median	Max	Obs
Fraction female	0.22					14,351
Fraction plasma/platelets	0.33					14,351
Age of donor	40.3	10.6	18	40	65	14,220
Days between consecutive donations	157.9	141.8	4	119	1,749	12,342

Table 2: Descriptive Statistics. Sample period: 2002-2006.

	Whole Sample		
	no award	**"private" award**	**"public" award**
Mean	157.9	164.6	109.5
Median	119	129	98
St.Dev.	142.9	131.7	76.2
N. Obs.	11,428	796	118
	Males		
	no award	**"private" award**	**"public" award**
Mean	151.4	158.5	103.5
Median	116	126	98
St.Dev.	134.2	126.0	71.5
N. Obs.	9,036	595	109
	Males, Whole blood only, Adjusted (*)		
	no award	**"private" award**	**"public" award**
Mean	100.3	105.8	48.1
Median	51	58	29
St.Dev.	152.2	146.2	70.2
N. Obs.	3,724	265	39

Table 3: Elapsed days between consecutive donations, 2002-2006. The table reports statistics on the number of days between consecutive donations (n-1 and n) for the cases where donation n does not correspond to any medal ("no award"), donation n corresponds to privately awarded medals ("private" awards), and donation n corresponds to publicly awarded medals ("public" awards). (*) For the subsample of males who only donate whole blood, we report statistics on the "excess" interval, i.e., the days between consecutive donations minus 90, where 90 is the minimum required number of days between donations.

	Dependent variable: days between consecutive donations			
	Ordinary Least Squares			Fixed Effects
	(1)	(2)	(3)	(4)
Private award [1]	-3.041	-15.61***	-15.82***	-9.780*
	(5.911)	(5.766)	(5.753)	(5.044)
Public award [2]	-42.89***	-26.02***	-46.33***	-26.60***
	(9.215)	(9.256)	(10.060)	(8.039)
Female	49.41***	32.78***	32.65***	
	(5.197)	(4.908)	(4.786)	
Age 30-39	-1.795	-8.193	-6.689	-15.00*
	(5.823)	(5.342)	(5.221)	(8.491)
Age 40-49	-15.56***	-8.826	-8.378	-15.07
	(5.845)	(5.568)	(5.458)	(12.240)
Age 50 +	-26.51***	-16.25**	-15.70**	-24.84*
	(5.999)	(6.490)	(6.347)	(14.970)
Plasma/platelets [3]	-79.29***	-59.65***	-58.56***	-36.60***
	(3.377)	(3.128)	(3.110)	(2.928)
Number of past donations		-2.508***	-3.144***	-10.23***
		(0.235)	(0.297)	(1.050)
Donation>50 [4]			52.36***	18.75**
			(8.781)	(9.059)
Constant	126.3***	559.4***	585.8***	321.1***
	(6.213)	(29.970)	(32.850)	(22.830)
Year fixed effects	Yes	Yes	Yes	Yes
Cohort fixed effects	No	Yes	Yes	-
Individual Fixed Effects	No	No	No	Yes
Observations	12,289	12,287	12,287	12,287
R-squared	0.11	0.18	0.19	0.10
Number of donors (FE)				1,725

Table 4: Award and Frequency of Donation: Regression Results. The dependent variable is the number of days between consecutive donations. Standard errors (in parentheses) are in all cases clustered by individual donor. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. (1) Private Award is an indicator variable equal to 1 if the corresponding donation is the 8th, 16th, or the 24th (i.e., donations associated with a privately awarded prize). (2) Public Award is an indicator variable equal to 1 if the corresponding donation is the 50th, 75th, or the 100th (i.e., donations associated with a publicly awarded prize). (3) Plasma/platelets is an indicator variable equal to 1 if a given donation is of plasma or platelets and 0 if it is of whole blood. (4) Donation>50 is an indicator variable equal to 1 for donations from the 50th up.

	Dependent variable: days between consecutive donations		
	All donors, Fixed Effects		
	(1)	(2)	(3)
2 donations before Private award		8.009	
		(5.780)	
1 donation before Private award		0.704	
		(5.790)	
Private award [(1)]	-9.780*	-8.883*	-9.827*
	(5.044)	(5.320)	(5.060)
1 donation after Private award		6.064	
		(6.560)	
2 donations after Private award		-5.6	
		(5.330)	
2 donations before Public award		-16.61*	
		(9.650)	
1 donation before Public award		2.445	
		(10.600)	
Public award [(2)]	-26.60***	-27.89***	-27.70***
	(8.039)	(8.500)	(9.090)
1 donation after Public award		6.339	
		(12.100)	
2 donations after Public award		-13.85	
		(10.100)	
Public award*(month of ceremony)			-33.19**
			(15.600)
Public award*(1 month before ceremony)			21.2
			(13.000)
Public award*(2 months before ceremony)			-24.44
			(27.300)
Public award*(3 months before ceremony)			18.36
			(29.500)
Public award*(4 months before ceremony)			22.73
Year fixed effects	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes
Observations	12,287	12,287	12,287
R-squared	0.10	0.10	0.10
Number of donors (FE)	1,725	1,725	1,725

Table 5: Award and Frequency of Donation: Distance to Ceremony and Leads and Lags. The dependent variable is the number of days between consecutive donations. Standard errors (in parentheses) are in all cases clustered by individual donor. *** p<0.01, ** p<0.05, * p<0.1. (1) Private Award is an indicator variable equal to 1 if the corresponding donation is the 8th, 16th ,or the 24th (i.e., donations associated with a privately awarded prize). (2) Public Award is an indicator variable equal to 1 if the corresponding donation is the 50th, 75th, or the 100th (i.e., donations associated with a publicly awarded prize). Controls include year effects, month effects, an indicator for whether the donation was of blood components (plasma or platelets), age dummies (18-29, 30-39, 40-40, 50+), the number of past donations, and an indicator for donations above the 50th.

	Dependent variable: days between consecutive donations			
	Fixed Effects			
	All donors	Males	Males Whole Blood	Males, Whole Blood, Eventually reaching 50+ donations
	(1)	(2)	(3)	(4)
8th donation award	-9.931*	-13.29*	-18.2	
	(5.906)	(6.839)	(14.590)	
16th donation award	-2.474	-1.225	0.912	
	(7.810)	(8.527)	(14.980)	
24th donation award	-4.235	-5.228	-6.328	
	(6.206)	(6.329)	(8.270)	
50th donation award	-20.84**	-21.70**	-26.11**	-28.28**
	(10.60)	(9.74)	(13.25)	(13.04)
75th donation award	-4.701	-3.612	13.48	8.795
	(9.989)	(9.804)	(22.340)	(23.430)
100th donation award	-0.65	-2.518	4.207	0.238
	(12.320)	(10.920)	(13.000)	(11.380)
Year fixed effects	Yes	Yes	Yes	Yes
Individual Fixed Effects	Yes	Yes	Yes	Yes
Observations	12,287	9,719	4,015	872
R-squared	0.10	0.08	0.09	0.09
Number of donors (FE)	1,725	1,237	682	95

Table 6: Award and Frequency of Donation: Robustness Checks. The dependent variable is the number of days between consecutive donations. Standard errors (in parentheses) are in all cases clustered by individual donor. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Controls include year effects, month effects, an indicator for whether the donation was of blood components (plasma or platelets), age dummies (18-29, 30-39, 40-40, 50+), the number of past donations, and an indicator for donations above the 50th.

B Figures

LA CELEBRAZIONE

L'ex presidente della sezione [redacted] apre l'elenco di coloro che hanno ricevuto il riconoscimento

Premiati i soci Avis, il record con 186 donazioni

[redacted] - Il riconoscimento, pur prezioso è simbolico, evidenzia una vita in cui l'impegno nel settore del volontariato è stato predominante, quasi che la solidarietà verso il prossimo fosse una costante di comportamento.

L'Avis di [redacted] ha premiato nei giorni scorsi i donatori di sangue che hanno raggiunto un numero significativo di donazioni. E' stata una cerimonia, a cui hanno partecipato le autorità cittadine, ma soprattutto i soci, in cui si sono evidenziate le necessità di sangue, sempre più difficili da soddisfare nella loro interezza e le risposte che la sezione di [redacted] la prima della provincia per donazioni effettuate, del tutto gratuitamente è riuscita a dare.

Per questo è stato numeroso il gruppo di donatori che ha ricevuto il rispettivo riconoscimento. Coloro che hanno raggiunto le 50 donazioni sono stati 38. Hanno ricevuto il [redacted]

[redacted] 18 soci che hanno raggiunto 75 donazioni. Hanno ricevuto il distintivo d'oro [redacted]. Altri cinque donatori hanno raggiunto o superato le 100 donazioni, ricevendo così un piccolo [redacted] Più sono i donatori che hanno ricevuto con un numero più alto di donazioni [redacted] tratta di veri e propri record che dimostrano la costanza e l'attaccamento ai fini associativi di tante persone che hanno iniziato la loro attività di volontariato in giovane età. E proprio verso i giovani si indirizza [redacted] dell'Avis [redacted] particolarmente presente nel mondo dello sport e in quello della scuola.

m.f.

Figure 1: Article from a local newspaper in The Town reporting the names of all donors awarded for reaching 50, 75, and 100 donations, in occasion of the biannual ceremony of the local AVIS Chapter. The name of the town and of the rewarded donors have been redacted for confidentiality reasons.

Figure 2: Sample AVIS membership card. The donor's personal information and any possible identifying detail have been redacted for confidentiality reasons.

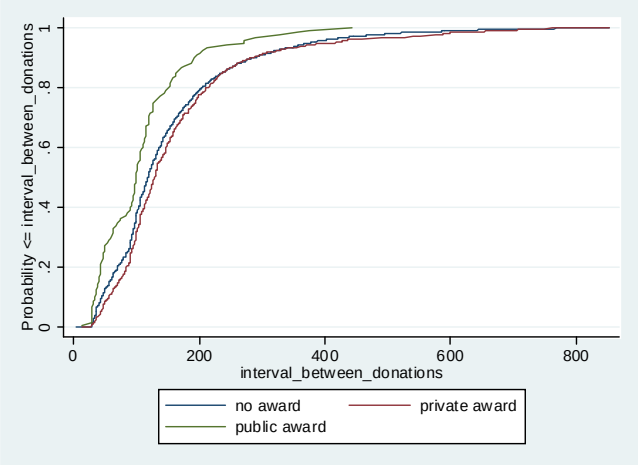

Figure 3: Distribution of elapsed times (days) between consecutive donations (donations leading to no award, to a private award, and to a publicly recognized award).

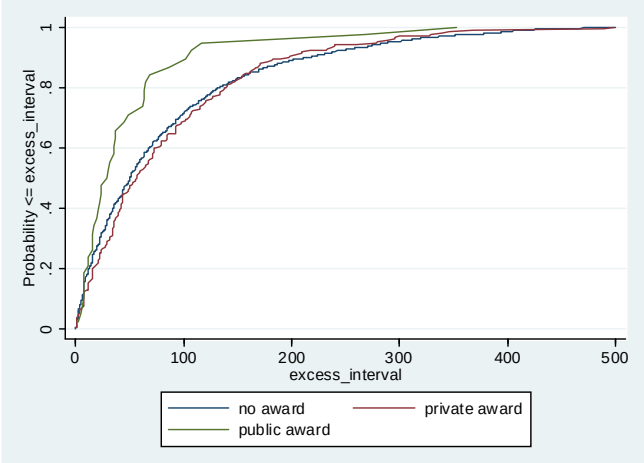

Figure 4: Distribution of elapsed times (days) between consecutive whole blood donations in excess of 90 (the minimum interval required by law for male whole blood donors). Male whole blood donors only.