

# Social Image Concerns and Prosocial Behavior: Field Evidence from a Nonlinear Incentive Scheme\*

Nicola Lacetera<sup>†</sup>  
Case Western Reserve University

Mario Macis<sup>‡</sup>  
University of Michigan and IZA

June 26, 2009

## Abstract

Using longitudinal data on the entire population of blood donors in an Italian town, we examine how donors respond to a nonlinear award scheme which rewards them with symbolic 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 indicate that social image concerns are a primary motivator of prosocial behavior, and that symbolic prizes are most effective as motivators when they are awarded publicly. We discuss the implications of our findings for policies aimed at incentivizing prosocial behavior.

Keywords: Incentives, Awards, Public Good Provision, Pro-social Behavior, Public Health, Social Prestige.

JEL Codes: D12, D64, I18.

## 1 Introduction

Prosocial activities represent a substantial part of social life, including such actions as donating money for a cause or an organization, volunteering for a party during election times, cleaning beaches, or donating blood. The economic value of the resources devoted to volunteering or charitable giving is considerable. In the US, for example, charitable giving totals over \$260

---

\*We thank Gary Becker, Antonio Lacetera, Francesca Mazzolari, Emily Oster, Heather Royer, Fernanda Ruiz Nunez, Jesse Shapiro, Justin Sydnor, and seminar participants at the University of Chicago, Cleveland State University, Case Western Reserve University, the University of Michigan, and UC Irvine for their comments. We are grateful to the President and Board members of The Town's unit of the Italian Association of Blood Donors (Associazione Volontari Italiani del Sangue, AVIS), and to the Head and staff of the Transfusion Unit in The Town's Hospital for their precious collaboration. Raffaella Manna has offered an invaluable contribution to the data collection effort, and Hong Pum Chung has provided excellent research assistance. Financial support from the Ross School of Business Small Grants Research Fund is gratefully acknowledged.

<sup>†</sup>Department of Economics, Weatherhead School of Management, Case Western Reserve University. E-mail: nico.lacetera@case.edu

<sup>‡</sup>Department of Business Economics and Public Policy, Ross School of Business, University of Michigan. E-mail: mmacis@bus.umich.edu

billon, or around 1.9% of personal income (Andreoni 2007), and the estimated dollar value of volunteer time is over \$240 billion (Independent Sector 2006). Understanding what motivates individuals to contribute to prosocial causes emerges, therefore, as a topic of increasing interest in economics. The issue is made all the more pressing by the fact that, for many of these activities, supply is often below societal needs.

Blood donations are a prominent example of the diffusion of altruistic activities on the one hand, and on the insufficiency of the supply on the other.<sup>1</sup> Situations of shortage are the rule rather than the exception in most western countries, and even more so in developing nations.<sup>2</sup> 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. Even though many individuals are eligible to donate blood and there are numerous awareness campaigns promoting its importance, only a small percentage of eligible individuals (between 5% and 10%) donate blood in the Western world and even fewer do so in developing countries. 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. If this is the case, then explicit incentives might be effective in increasing the number and frequency of donations by the eligible population. To understand what kind of incentives might encourage prosocial behavior, however, one must first have an understanding of the motives behind altruistic behavior. In fact, recent empirical and theoretical contributions suggest that depending on what motivates individuals to contribute to prosocial causes, certain types of incentives might backfire. Edward Deci and his collaborators, for instance, found that providing pecuniary 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), Gneezy and Rustichini (2000), Mellstrom and Johannesson (2008), and Ariely, Bracha, and Meier (2008).<sup>3</sup> Other types of extrinsic incentives, however,

---

<sup>1</sup>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).

<sup>2</sup>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).

<sup>3</sup>A few findings indicate a positive impact of material, non-cash incentives. Goette and Stutzer (2008) find

could increase the motivations to perform pro-social activities while avoiding the drawbacks of more material forms of payment. For example Frey and Neckermann (2008) argue that, unlike explicit payments, symbolic awards may be less costly, create a special relationship between the awarding and awarded parties, and increase the self-esteem or "warm glow" (Andreoni, 1989), social status, and social recognition of the receiver, while rewards with an immediate monetary value 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 (Benabou and Tirole, 2006).<sup>4</sup> 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 rewards on the performance of pro-social activities. We investigate, first, whether individuals care about receiving symbolic awards and, second, whether they do so because of the social recognition attached to them. To address these issues, we analyze the effects of a nonlinear, 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, combined with the nonlinearity of the incentive, provides us with 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. The logic behind our analysis follows the small but growing literature that exploits nonlinear incentive schemes to investigate alternative motivations behind observed behavior (Asch 1990, Oyer 1998, Oettinger 2002, Meer and Rosen 2008). If donors' only motive is "pure" altruism, their donation patterns should not change in response to the award scheme. If donors do care about the award, and their response is due to such motives as the attachment to the Association as represented by the medal, or simply "warm glow," then donors should respond to the award scheme, but we should not observe any difference in the response to privately and publicly assigned awards. Finally, if donors are attracted by the increase in social prestige deriving from reaching a certain donation quota, then donors' responses should be more pronounced in correspondence 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-

---

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.

<sup>4</sup>Ellingsen and Johannesson (2007) offer a survey of studies of the role of symbolic rewards.

sized town (The Town hereinafter) between 2002 and 2006.<sup>5</sup> 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 only in proximity of those prizes that are publicly awarded. 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 tool to increase the supply of blood. Our interpretation of the results is strengthened by the finding that the acceleration in donation frequency is stronger when the donation that corresponds to a public award occurs in the month immediately before the award ceremony.

The findings in this paper are consistent with a number of economic theories and anecdotal evidence on the role of social prestige concerns for the performance of pro-social activities and the provision of public goods.<sup>6</sup> Systematic empirical evidence on the impact of social image concerns is scant, however. Notable exceptions are represented by a few experimental studies. Ariely et al. (2008) find that their subjects would type faster on a keyboard, or cycle faster on a stationary bike, when these activities are associated to donations to "good causes" and the subjects' performance is publicized. Andreoni and Bernheim (2008) find that the preference for fairness may be due to social image concerns. Neckermann and Frey (2007), in a corporate setting, document 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 providing novel findings from new sources of data, our study presents a number of methodological contributions, and it complements the existing experimental literature on the impact of explicit incentives on the performance of altruistic activities. To the best of our knowledge, our study is the first to analyze the actual behavior of an entire (and therefore representative) population of blood donors in response to a *naturally occurring* reward scheme. The fact that the incentive is naturally occurring attenuates some recently expressed concerns about social desirability bias in the experimental literature (Levitt and List 2007). Finally, the longitudinal nature of our data allows observing the same individuals multiple times, thus allowing us to control for observed and unobservable individual heterogeneity.

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

---

<sup>5</sup>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.

<sup>6</sup>See for example Harbaugh (1998a, 1998b), Benabou and Tirole (2006), Polborn (2007), Ellingsen and Johannesson (2008), Andreoni and Bernheim (2008). Scholars in other disciplines have advanced similar claims (Goode 1978, Wedekind 1998, Nowak and Sigmund 2000, Price 2003)

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 used 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 part of the country.<sup>7,8</sup> 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 town-level 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).<sup>9</sup> 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 largest blood donor association, AVIS, and aphereses of either whole blood or blood's components (plasma, platelets) are performed at The Town's public hospital, Monday through Saturday from 8 to 11 a.m. Donors do not make appointments, and they typically donate on a "first come, first served" basis.

The Italian law sets limits to the frequency of donations of blood and blood components. Whole blood can be collected once every 90 days from male donors and once every 180 days from females. Donors can give platelets once every 30 days and plasma once every 14 days. The time required for a platelet or plasma donation is about one hour, against an average of twenty minutes for a donation of whole blood. Including the time to reach the donation site, the

---

<sup>7</sup>The demographic, social, and economic characteristics of The Town's population are highly representative of the overall Italian urban population. Statistics comparing the Town with other Italian towns under a number of socio-economic characteristics are available upon request.

<sup>8</sup>We are extremely thankful to the President, Board, members, and staff of The Town's unit of the Italian Association of Blood Donors (*Associazione Volontari Italiani del Sangue*, AVIS), and to the Head and staff of the Transfusion Unit in The Town's Hospital, for their precious collaboration.

<sup>9</sup>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.

waiting time before the donation and the resting time at the hospital after the donation (which is longer for whole blood donation), on average a blood donor should expect a commitment of about two hours.

## 2.1 Rewarding and recognizing donors through 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, the recipients of the awards associated with the 8th, 16th, 24th are notified and awarded "privately," i.e., they pick up their medals at the Association's local office; when a donor reaches the 50th, 75th and 100th donation, instead, (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 research design

### 3.1 Data

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. More than 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. 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.

[Table 2 about here]

### 3.2 Hypotheses and research design

Our approach is to exploit the nonlinearity of the symbolic award scheme put in place by AVIS, as described above, in order to ascertain whether social image concerns motivate blood donors. Nonlinear award schemes have been successfully exploited in other contexts, not just to evaluate whether individuals respond to incentives (Asch 1990, Oyer 1998), but also to distinguish between alternative motivations behind individuals' actions. Oettinger (2002), for instance, finds that students who are closer to a grade boundary before an exam perform better, controlling for pre-exam performance. He interprets his findings as evidence that students are "grade motivated" rather than purely "learning motivated": If they were just "learning motivated," their choice of effort would not change depending on whether they are far or near one of the grade boundaries. In the context of charitable giving, Meer and Rosen (2008) detect "selfish" (as opposed to purely altruistic) considerations in donations of alumni by observing that donations increase as the alumni's children approach college age, and especially so when their children actually apply to their parents' *alma mater*.

In our setting, suppose that a donor is intrinsically motivated to donate, but, potentially, is also responsive to the presence of rewards. There are two types of rewards, which depend on the particular number of donations made: private rewards and public rewards, i.e., rewards that include letting the community know about one's donation activity. These rewards define a nonlinear incentive scheme, since they are conferred only if some thresholds are reached. Call the intrinsic benefit from a donation  $B$ ; define a variable  $r$  equal to 1 if a private reward is associated to a donation and zero otherwise, and a variable  $R$  equal to 1 if a public reward is associated to a donation and zero otherwise. Donating blood entails a cost  $c$ . In a given day, and given the number of past donations made, a donor decides to donate if  $U_{i,n} = B_{i,n} + \gamma_{i,n}r_n + \delta_{i,n}R_n \geq c_{i,n}$ , where  $\gamma$  and  $\delta$  are parameters indicating the response to the presence of private or public rewards, and all variables are individual specific and also indexed by the number of donations already made. If donors are motivated by "pure" altruism, the pattern of their donations should not be systematically related, *ceteris paribus*, to whether a given donation is associated with an award. Equivalently,  $\gamma$  and  $\delta$  would be zero, and the probability that  $U_{i,n} - c_{i,n} \geq 0$ , and therefore that

a donation is made in a given day, would not depend on the presence of a reward associated to making that donation. If donors, however, do place importance on the symbolic awards, then we should expect their donation patterns to be influenced by the incentive scheme thus defined. More specifically, the fact that two different types of medals are awarded allows us to evaluate whether donors care about the award per se or whether, instead, what matters is the public recognition. If donors are motivated merely by a desire for medals, or self-esteem, then we should not observe any difference in the response to privately and publicly assigned awards: The parameters  $\gamma$  and  $\delta$  would have similar (positive) values. In a given day and for a given number of donations made  $n - 1$ , the probability that  $U_{i,n} - c_{i,n} \geq 0$  would be greater if  $r = 1$  or  $R = 1$  at donation  $n$ , i.e. if either a private or public reward is associated with donation  $n$ . As a consequence, the expected lag between donation  $n - 1$  and donation  $n$  would be shorter if a reward is obtained by making the  $n^{th}$  donation. If, however, donors are attracted by the increase in social prestige deriving from reaching a certain donation quota, then donors' responses should be more pronounced in correspondence to the public awards: We will have  $\delta > \gamma$ , and the expected time lapsed between two consecutive donations would be shorter when  $R_n = 1$  than when  $r_n = 1$ .

Indexing the variables of this simple model by the individual donor and the number of donations is particularly important. Such factors as 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<sup>10</sup> – might be associated with donation frequency for reasons that are not related to the response to rewards and social image concerns. 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. These considerations do not affect our hypotheses: They just highlight the importance of including appropriate controls in the econometric analysis. In the analysis that follows, we test the hypotheses outlined above through an empirical strategy that controls for observable characteristics of donors, and also exploits the longitudinal nature of our individual donation data to control for donor fixed effects.

---

<sup>10</sup>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.

## 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 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  $n$ th 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,  $\gamma_t$  and  $\mu_m$  are vectors of year and month dummies respectively, and the error term is composed of an individual-specific component  $\delta_i$  and a "white noise"  $\varepsilon_{i,n,m,t}$ .

Table 4 reports the results of four specifications.<sup>11</sup> The main coefficients of interest are  $\beta_1$  and, especially,  $\beta_2$ : they represent estimates of the changes in the donations lag in correspondence of private and public rewards respectively, as compared to any other donation. The estimates of these two parameters would inform us on the value of the parameters  $\gamma$  and  $\delta$  in the donors' utility function described in the previous section.

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.

---

<sup>11</sup>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 qualitatively similar results in terms of both the signs of coefficients and their statistical significance.

[Table 4 about here]

#### 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  $n$ th 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.

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 substantially 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. We interpret this finding as indicating that social image concerns are an important motivator of blood donation.

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. In addition, we contribute to the literature that exploits nonlinear incentive schemes to investigate alternative motivations behind observed behavior (Oettinger 2002, Meer and Rosen 2008).

By demonstrating 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. In their decisions on how to incentivize and reward their contributors, charitable organizations should consider the positive response to public recognition as a potentially strong (and cost-effective) motivator. More research is needed, however, to precisely quantify the effect of an award scheme such as the AVIS one in terms of attracting new donors and motivating them to donate regularly, as well as to establish what is the "optimal" design of symbolic awards schemes. An "excessive" number of rewards for example, say in terms of how often they are given to contributors and to how many contributors they are given, might dilute to 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 mechanism through which public rewards might increase donations is by conveying "social information" about the behavior of others (Shang and Croson 2008). In addition, having the organization disclose the information on donors' charitable behavior to the rest of the community can help in situations where donors might be reluctant to disclose the information themselves, e.g., because boasting about one's altruism is viewed skeptically (Harbaugh and To 2008). A final 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 [1990, 1993], Andreoni, Harbaugh, and Vesterlund 2007), then public contributions should not result in a net crowd out of private contributions. 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.

## References

- [1] Andreoni, J., 1989: "Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence," *Journal of Political Economy*, 97, 1447-58.
- [2] Andreoni, J., 1990: "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving," *Economic Journal*, 100, 464-77.
- [3] Andreoni, J., 1993: "An Experimental Test of the Public Goods Crowding-Out Hypothesis," *American Economic Review*, 83, 5, 1313-27.
- [4] Andreoni, J., 2007: "Charitable Giving," *The New Palgrave Dictionary of Economics*, 2nd Edition.
- [5] Andreoni, J., Harbaugh, W. and Vesterlund, L., 2007: "Altruism in Experiments," *The New Palgrave Dictionary of Economics*, 2nd Edition.
- [6] Andreoni, J. and Bernheim, B.D. 2008: "Social Image and the 50-50 Norm: A Theoretical and Experimental Analysis of Audience Effects," mimeo, University of California at San Diego.
- [7] Ariely, D., Bracha, A. and Meier, S., 2008: "Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially," *American Economic Review*, forthcoming.
- [8] Asch, B.J., 1990: "Do Incentives Matter? The Case of Navy Recruiters," *Industrial and Labor Relations Review*, 43, 3, 89-106.
- [9] Bénabou, R. and Tirole, J., 2005: "Incentives and Prosocial Behavior," *American Economic Review*, 96, 5, 1652-78.
- [10] Caligaris, A.O., 2007: "Relazione del Presidente," *46th National Annual Conference, FIDAS*.
- [11] Deci, E.L., 1975: *Intrinsic Motivation*, Plenum Press.
- [12] Ellingsen, T. and Johannesson, M., 2007: "Paying Respect," *Journal of Economic Perspectives*, 21, 135-149.
- [13] Ellingsen, T. and Johannesson, M., 2008: "Pride and Prejudice: The Human Side of Incentive Theory," *American Economic Review* 98, 3, 990-1008.
- [14] Frey, B.S. and Oberholzer-Gee, F., 1997: "The Cost of Price Incentives: An Empirical Analysis of Motivation Crowding-Out," *American Economic Review*, 87, 4, 746-755.
- [15] Frey, B.S. and Neckermann, S., 2008: "Awards - A View from Psychological Economics," CREMA Working Paper 2008-02.

- [16] Gneezy, U., and Rustichini, A., 2000: "Pay Enough or Don't Pay At All," *Quarterly Journal of Economics*, 115, 3, 791-810.
- [17] Goode, W.J., 1978: *The Celebration of Heroes: Prestige as a Social Control System*, Berkeley: University of California Press 1978.
- [18] Goette, L., and Stutzer, A., 2008: "Blood Donation and Incentives: Evidence from a Field Experiment," IZA Working Paper 3580.
- [19] Harbaugh, R. and To, T., 2008: "False Modesty: When Disclosing Good News Looks Bad," mimeo, Indiana University Kelley School of Business and Bureau of Labor Statistics.
- [20] Harbaugh, W.T., 1998a: "What do Donations Buy? A Model of Philanthropy Based on Prestige and Warm Glow," *Journal of Public Economics*, 67, 269-284.
- [21] Harbaugh, W.T., 1998b: "The Prestige Motive for Charitable Transfers," *American Economic Review*, 88, 2, 277-282.
- [22] Healy, K., 2006: *Last Best Gifts: Altruism and the Market for Human Blood and Organs*, University of Chicago Press.
- [23] Hemobiotech, 2008: <http://www.hemobiotech.com>, site last visited on October 7th 2008.
- [24] Independent Sector, 2006: "Value of Volunteer Time," available at <http://unitedwaypike.veneziale.net/Volunteers/is-dollar-value.pdf>.
- [25] Lacetera, N. and Macis, M., 2008: "Motivating Altruism: A Field Study," IZA Discussion Paper.
- [26] Leibenstein, H., 1950: "Bandwagon, Snob, and Veblen Effects in the Theory of Consumers Demand," *Quarterly Journal of Economics*, 622, 183-207.
- [27] Levitt, S.D. and List, J.A., 2007: "What do Laboratory Experiments Measuring Social Preferences Tell Us About the Real World," *Journal of Economic Perspectives*, 21, 2, 153-74.
- [28] Meer, J. and Rosen, H.S., 2008: "Altruism and the Child-Cycle of Alumni Donations," *American Economic Journal: Economic Policy*, forthcoming.
- [29] Mellstrom, C. and Johannesson, M., 2008: "Crowding Out in Blood Donation: Was Titmuss Right?," *Journal of the European Economic Association*, 6, 4, 845-63.
- [30] Neckermann, S., and Frey, B.S., 2007: "Awards as Incentives," Institute for Empirical Research in Economics Working Paper No. 334.
- [31] Nowak, M.A. and Sigmund, K., 2000: "Shrewd Investments," *Science*, 288, 5467, 819-820.

- [32] Oettinger, G.S., 2002: "The Effect of Nonlinear Incentives on Performance: Evidence from Econ 101," *Review of Economics and Statistics*, 84, 3: 509–17.
- [33] Oyer, P., 1998: "Fiscal Year Ends and Nonlinear Incentive Contracts: The Effect on Business Seasonality," *Quarterly Journal of Economics*, 113, 1, 149-185.
- [34] Pesendorfer, W., 1995: "Design Innovations and Fashion Cycles," *American Economic Review*, 85, 4, 771-92.
- [35] Polborn, M., 2007: "Competing for Recognition through Public Good Provision," CESifo working paper.
- [36] Price, M.K., 2003: "Pro-Community Altruism and Social Status in a Shuar Village," *Human Nature*, 14, 2, 191-195.
- [37] Shang, J. and Croson, R., 2008: "Field Experiments in Charitable Contribution: The Impact of Social Influence on the Voluntary Provision of Public Goods," *Economic Journal*, forthcoming.
- [38] Titmuss, R.M., 1971: *The Gift Relationship*," London: Allen and Unwin.
- [39] Wedekind, K., 1998: "Give and Ye Shall Be Recognized," *Science*, 280, 5372, 2070-2071.

## 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
<b>Total "private" awards</b>		<b>891</b>	<b>6.21</b>	<b>659</b>	<b>5.9</b>	<b>305</b>	<b>6.25</b>
"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
<b>Total "public" awards</b>		<b>126</b>	<b>0.88</b>	<b>117</b>	<b>1.05</b>	<b>44</b>	<b>0.9</b>
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.

<b>Donors</b>						
<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>	<b>Obs</b>
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	1,095
Past donations (donors active as of 12/31/01)	22.17	23.46	0	14	145	1,167
<b>Donations</b>						
<b>Variable</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Median</b>	<b>Max</b>	<b>Obs</b>
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.

<b>Whole Sample</b>			
	<b>no award</b>	<b>"private" award</b>	<b>"public" award</b>
<b>Mean</b>	157.9	164.6	109.5
<b>Median</b>	119	129	98
<b>St.Dev.</b>	142.9	131.7	76.2
<b>N. Obs.</b>	11,428	796	118

<b>Males</b>			
	<b>no award</b>	<b>"private" award</b>	<b>"public" award</b>
<b>Mean</b>	151.4	158.5	103.5
<b>Median</b>	116	126	98
<b>St.Dev.</b>	134.2	126.0	71.5
<b>N. Obs.</b>	9,036	595	109

<b>Males, Whole blood only, Adjusted (*)</b>			
	<b>no award</b>	<b>"private" award</b>	<b>"public" award</b>
<b>Mean</b>	100.3	105.8	48.1
<b>Median</b>	51	58	29
<b>St.Dev.</b>	152.2	146.2	70.2
<b>N. Obs.</b>	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 <sup>(1)</sup>	-3.041 (5.911)	-15.61*** (5.766)	-15.82*** (5.753)	-9.780* (5.044)
Public award <sup>(2)</sup>	-42.89*** (9.215)	-26.02*** (9.256)	-46.33*** (10.060)	-26.60*** (8.039)
Female	49.41*** (5.197)	32.78*** (4.908)	32.65*** (4.786)	
Age 30-39	-1.795 (5.823)	-8.193 (5.342)	-6.689 (5.221)	-15.00* (8.491)
Age 40-49	-15.56*** (5.845)	-8.826 (5.568)	-8.378 (5.458)	-15.07 (12.240)
Age 50 +	-26.51*** (5.999)	-16.25** (6.490)	-15.70** (6.347)	-24.84* (14.970)
Plasma/ platelets <sup>(3)</sup>	-79.29*** (3.377)	-59.65*** (3.128)	-58.56*** (3.110)	-36.60*** (2.928)
Number of past donations		-2.508*** (0.235)	-3.144*** (0.297)	-10.23*** (1.050)
Donation >50 <sup>(4)</sup>			52.36*** (8.781)	18.75** (9.059)
Constant	126.3*** (6.213)	559.4*** (29.970)	585.8*** (32.850)	321.1*** (22.830)
Wald test for public=private (Prob>F)	0.000	0.336	0.007	0.075
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)	
<b>Private award</b> <sup>(1)</sup>	-9.780* (5.044)	-8.883* (5.320)	-9.827* (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)	
<b>Public award</b> <sup>(2)</sup>	-26.60*** (8.039)	-27.89*** (8.500)	-27.70*** (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* (5.906)	-13.29* (6.839)	-18.2 (14.590)	
16th donation award	-2.474 (7.810)	-1.225 (8.527)	0.912 (14.980)	
24th donation award	-4.235 (6.206)	-5.228 (6.329)	-6.328 (8.270)	
50th donation award	-20.84** (10.60)	-21.70** (9.74)	-26.11** (13.25)	-28.28** (13.04)
75th donation award	-4.701 (9.989)	-3.612 (9.804)	13.48 (22.340)	8.795 (23.430)
100th donation award	-0.65 (12.320)	-2.518 (10.920)	4.207 (13.000)	0.238 (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



Figure 1: Article from a local newspaper in The Town reporting the names of all donors awarded for reaching 50, 75, and 100 donations, on 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.

**AVIS** Sede Nazionale

**Socio Donatore EFFETTIVO**

**SI CERTIFICA CHE IL SIG. [redacted] EFFETTUATO**

**FIRMA AD OGGI N° 6 DONAZIONI**

DATA	QUANTITÀ (ml)	FIRMA
14/06/10	400	[redacted]
11/11/10	450	[redacted]
25/08/10	450	[redacted]
19/04/10	450	[redacted]
11/10/10	450	[redacted]
05/02/10	450	[redacted]
14/01/10	450	[redacted]

Stamp: [redacted]

DATA	QUANTITÀ (ml)	FIRMA
11/1/10	400	[redacted]
20/6/10	400	[redacted]
5/1/10	400	[redacted]
11/6/10	400	[redacted]
20/2/10	400	[redacted]
19/10/10	400	[redacted]
15/1/10	400	[redacted]

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

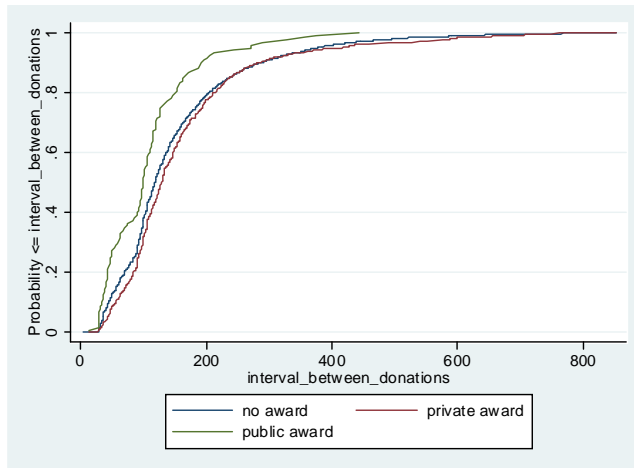


Figure 3: Distribution of elapsed times (days) between consecutive donations (donations leading to no award, to a private award, and to a publicly recognized award).

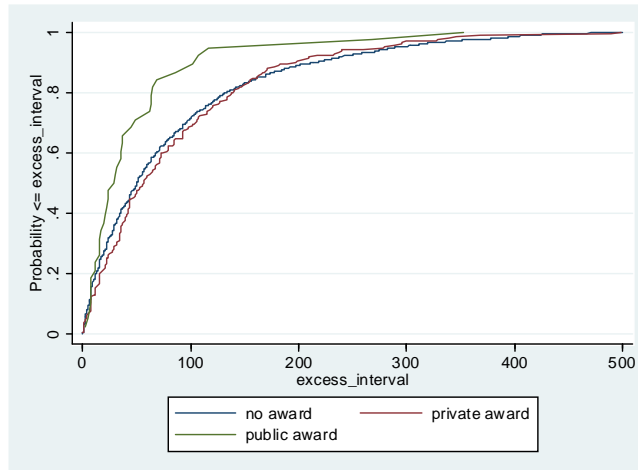


Figure 4: Distribution of elapsed times (days) between consecutive whole blood donations in excess of 90 (the minimum interval required by law for male whole blood donors). Male whole blood donors only.