# Embedded Altruism: Blood Collection Regimes and the European Union's Donor Population[1]

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Blood donation is often cited as a perfect example of altruism. But blood must be collected as well as donated, and the organizational basis of the blood supply has been largely neglected. This article is a comparative study of blood collection regimes in Europe. Regimes are found to affect donation rates and donor profiles. When the Red Cross collects blood, donation is tied to religious activity and other volunteering, unlike state and blood bank systems. This study argues that collection regimes produce their donor populations by providing differing opportunities for donations. The analysis contributes to an institutional perspective on altruism and highlights the need to attend to the socially embedded nature of altruistic as well as self-interested action.

## INTRODUCTION

Human blood is scarce, valuable, and much in demand, yet it is supplied by voluntary donors who receive nothing for their trouble. Blood donation has therefore been seen as "perhaps the purest example" of altruistic behavior (Elster 1990, p. 46). Its symbolic resonance—an anonymous gift of life to an unknown recipient—only makes it more likely to be mentioned in the same breath as altruism or volunteering (see, e.g., Radin 1996, p. 96; Etzioni 1988, p. 75; Walzer 1983, p. 91). Those in charge of the blood supply routinely stress that very few people give blood, and so we tend to think of donors as special people. The surprisingly small

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amount of research on blood donation shares this view and looks for the sources of a donor's "altruistic identity" (Piliavin and Callero 1991). For all these reasons, blood donors provide the perfect example to those interested in attacking the self-interested utility maximizer of neoclassical economics. *Homo economicus* would not give blood unless he was paid enough money; real-life donors do not reason in this way.

This article presents evidence for a different view. Economic sociologists argue that exchange must be understood by examining the social-structural framework that provides the incentives, opportunities, and constraints with which the actors think and work. Though we may morally prefer one to the other, this point should apply equally to both altruistic and selfish action. Granovetter's original argument about embeddedness criticized *both* over- and under-socialized pictures of the actor and argued for a focus on the social structures and relations that shape all action, rational and otherwise (Granovetter 1985, pp. 505–7). But the moral and rhetorical attractions of blood donation have insulated it from this kind of scrutiny. The institutional underpinnings of the blood supply have been almost entirely overshadowed by the image of the individual altruist. This article is a step toward redressing this imbalance. I argue that, when viewed comparatively, blood can be seen not so much as something that individuals donate, but as something that organizations collect.

All industrialized countries have a strong and permanent demand for blood. Large parts of their medical systems would very quickly collapse without it. Everything from emergency paramedical care to routine operations would become difficult or impossible. In addition, many people's lives depend on a constant supply of blood products. But different countries choose to meet this demand in different ways. Some manage to collect much more blood per capita than others, and they get it from different kinds of people. Some countries have a relatively small pool of regular donors and others a larger group of occasional suppliers. If the blood supply simply relied on the goodwill of individual altruists, it is not clear why such variation should exist. Yet there has been next to no empirical investigation of these cross-national differences.

I analyze a large survey that contains information on patterns of blood donation in the European Union. I describe and discuss blood collection practices within the European Union and identify three relevant sources of variation: (1) the organization in charge of collecting blood (namely, the state, the Red Cross, and blood banks), (2) the presence or absence of a volunteer donor group within a country, and (3) the presence or absence of for-profit plasma collection. I draw on research about blood donation and other kinds of volunteering to derive hypotheses about these organizational differences. The analysis shows that there are stable patterns of variation across different systems: different organizations collect their

blood from different kinds of people. Moreover, the act of blood donation looks very different under different systems. In Red Cross regimes, blood donation is tied to participation in religious organizations and resembles other kinds of volunteering. This is not true of countries where blood is collected by independent blood banks or the state. These findings contribute to a comparative, institutional approach to giving and volunteering (Salamon and Anheier 1998; Wuthnow 1991*b;* DiMaggio and Anheier 1990) and suggest that we should treat altruism with the same sociological skepticism that has long been applied to self-interest.

## THE ELUSIVE ALTRUIST: STUDIES OF BLOOD DONORS

The need for a comparative, institutional perspective on blood donation, and altruism in general, can be seen from the findings of the existing literature on individual donors. Studies generally try to establish the demographic characteristics and motivations of donors. When asked, most donors will give some altruistic reason for giving, often citing feelings of community attachment or some commitment to the common good as their motive. Researchers have tried to correlate these motives with the demographic characteristics of the donor. Reviews of research on donors find that the typical donor is a white male in his thirties with above-average income and educational attainment (Oswalt 1977), though the gender gap in donation may not be as wide today as it was in the past (Piliavin 1990).

These findings tend to mislead us about the special character of donors. They "suggest that there is a class of people that makes donations and another class that does not" (Roberts and Wolkoff 1988, p. 170). The reality is that, more often, "many people with the characteristics of the typical donor are unlikely to be donors. Many with the characteristics of the typical nondonor do in fact donate" (Roberts and Wolkoff 1988, p. 170). This should make us suspicious of simply thinking that the key to understanding altruism is to be found in the personal characteristics of donors.

There are some strictly individual constraints on donation. Women give blood less often than men for medical reasons. Women are lighter than men on average. They are also more prone to anemia and can become pregnant. Each of these conditions disqualifies one from donating, and so there are fewer women in the pool of potential donors. Older people are also more likely to be excluded from the donor pool for medical reasons. This does not explain why better-off and better-educated people give more. Nor does it explain why relatively few eligible people give in the first place. The motives of donors are clearly important but should not stop us from asking how the institutional setting—the organization of recruitment, collection, and publicity—might make it more or less difficult for some kinds of people to donate blood.

Studies of donor motivation do sometimes recognize the role of institutions, though their research design usually prevents them from investigating this role properly. Asking how more blood might be collected, Roberts and Wolkoff (1988) recommend that the structure of incentives offered to donors be changed, as opposed to searching ever harder for elusive altruists. Piliavin and Callero (1991) follow first-time donors longitudinally and report on donors with different degrees of experience. They develop an analysis of how a person grows into a "donor-role." But they also recognize that other, nonindividual factors are important. They give evidence that both personal networks and simple organizational differences have important effects on donation rates. If many of your friends are donors, you are likely to be a donor as well. The accessibility of blood centers—whether collection points are mobile or fixed, for example—also affects whether people give. However, their research design confines them to the United States, and so the effect of large-scale institutional variation is outside the scope of their study.

## Hypotheses about Individual Donors

The findings from this literature are easy to summarize. The data analyzed here allow us to replicate previous work in this area in a cross-national research design. Studies have found a reliable "modal profile" for blood donors and a similarly typical pattern of altruistic motives (Piliavin 1990; Oswalt 1977; Oswalt and Hoff 1975; London and Hemphill 1965). The link between the two is not so clear, however, as many who donate do not fit the profile. On the basis of these studies, the expected demographic characteristics of individual donors can be summed up in the following hypotheses:

HYPOTHESIS 1.—*The modal donor is a male in his thirties.*

HYPOTHESIS 2.—*The odds of donating blood increase with educational attainment.*

HYPOTHESIS 3.—*The odds of donating blood increase with income.*

Piliavin and Callero's (1991) work suggests that people are more likely to donate blood if they know other donors, or if they know people who have received transfusions (or other blood products). Similarly, Drake, Finkelstein, and Sapolsky (1982, pp. 81–83) report that those who are "close to blood needs" will be more likely to donate. We should expect typical network effects here: if all your friends are blood donors, you are likely to be one too. If you know a hemophiliac, you should also be more likely to have given blood at some point.

HYPOTHESIS 4.—*The odds of donating blood increase if you know anyone (including oneself) who has received a blood transfusion.*

I already noted that strictly medical reasons do not explain why better-

educated and better-off people are more likely to give. Arguing that such people are more likely to be altruistic does not seem to take us much further. Individual motives for giving blood may be less important than institutionalized methods of collecting it. I now examine this possibility in detail.

## BLOOD COLLECTION REGIMES IN THE EUROPEAN UNION

Richard Titmuss's *The Gift Relationship* (1971, 1997) remains the only study of cross-national institutional variation in the blood supply. It is still frequently cited for its finding that voluntary donation is both more socially just and economically efficient than for-profit exchange in blood. But the book is almost 30 years old and out of date in many important respects. Titmuss compared the American and British systems as they existed around 1969, when it was still possible to sell your blood in the United States. There has been essentially no commercial collection of whole blood in the United States since 1974, a policy change brought about in large part by the book itself. Though still a voluntary system, institutional conditions in the United Kingdom have also changed substantially (LeGrand 1997). And the events surrounding the emergence of HIV in the blood supply seriously challenged many of Titmuss's central claims. In particular, the AIDS disaster showed that the relationships blood collection organizations had with their suppliers and recipients were subtler than Titmuss realized. Relying on voluntary donors did not protect against HIV contamination, and in some ways, the commercial sector reacted more responsibly to the crisis than the voluntary sector (Healy 1999).

Although the details of his argument no longer apply, Titmuss rightly pointed away from individuals and toward the system as a whole. He did not think that Britain's blood supply was maintained by a nation of saintly individuals. Rather, their altruism was socially sustained through the structure of the health system.

How is the collection of blood organized in Europe today? In spite of a common EU policy encouraging voluntary donation, we find that rates of donation and modes of organization differ considerably across countries.

### Cross-National Variation in Giving

Table 1 shows the percentage of people in each country who have ever given blood, as reported in the 1993 Eurobarometer survey (Reif and Marlier 1994). The rate ranges from 14% in Luxembourg to 44% next door in France. This wide variation in donation rates is interesting. Why should

TABLE 1

RESPONDENTS WHO HAVE EVER GIVEN BLOOD, BY COUNTRY (%)

| Country | Donors | *N* |
|---|---|---|
| France | 44 | 1,027 |
| Greece | 38 | 1,009 |
| Denmark | 34 | 1,004 |
| United Kingdom* | 32 | 1,064 |
| Germany | 30 | 2,110 |
| The Netherlands | 28 | 1,014 |
| Ireland | 27 | 1,066 |
| Spain | 24 | 986 |
| Italy | 21 | 1,052 |
| Belgium | 20 | 1,077 |
| Norway | 16 | 996 |
| Portugal | 16 | 1,000 |
| Luxembourg | 14 | 621 |

* Excluding Northern Ireland.

there be as much as 20 or 30 percentage points difference between France and Greece, on the one hand, and Luxembourg and Portugal on the other? If we think of donation as purely a question of individual motivation, it seems unlikely that some general propensity to generosity should vary quite so sharply across Europe. We should also be wary of writing the difference off to cultural variation, particularly given that countries that we might expect to fall together culturally (e.g., France and Luxembourg, Denmark and Norway) have dissimilar donation rates.

I argue that individual-level explanations cannot account for this variation. We should instead look to organizational variation to explain the differences.

## Cross-National Variation in Organization

There are three relevant institutional features of the blood supply that vary across Europe: the *collection regime,* the presence of *volunteer donor organizations,* and the presence of *for-profit plasma collection.*

*Three collection regimes.*—In 1989, a European Community directive committed the European Union to securing its supply of whole blood and plasma from voluntary, unpaid donors. However, this commitment to voluntarism said nothing about the kind of organization that should do the collecting. At the same time, the Council of Europe commissioned a series of research papers on blood suppliers that were later published as white

TABLE 2

EUROPEAN BLOOD COLLECTION REGIMES

| System Type | Country |
|---|---|
| State run | Britain |
| | France |
| | Ireland |
| Blood banks | Denmark |
| | Greece |
| | Italy |
| | Norway |
| | Portugal |
| | Spain |
| Red Cross | Belgium |
| | Luxembourg |
| | The Netherlands |
| | Germany |

papers (Hagen 1993; van Aken 1993; Genetet 1998). One of these (Hagen 1993) is based on interviews with those responsible for the blood and plasma supply in each EU member state and describes the different sorts of organization that exist within these countries.

There are three blood collection regimes in Europe (Hagen 1993, p. 34–85).[2] First, in some countries, a national health service or nationally run blood organization collects all of that country's blood. Countries with this sort of system have no other collection agencies. Second, the Red Cross may have a monopoly on collection or control a majority of it (with a minority held by hospital or community blood banks). Third, blood banks may have a monopoly on collection or control a majority of it (with a minority held by the Red Cross). According to the Council of Europe, countries fall into these categories as shown in table 2.

The British, Irish, and French national health systems have a monopoly on blood collection in their respective countries. These countries make up the "state" category. In the "blood bank" category, Denmark is the only country where banks have a monopoly. The other members of this group (Greece, Italy, Norway, Portugal, and Spain) have blood bank majorities, with a Red Cross minority share. In Belgium, Luxembourg, and The Netherlands, the Red Cross has a monopoly on the supply. In Germany, the Red Cross has a majority share of the supply, and blood banks have

[2] Unless otherwise cited, information in this section comes from this Council of Europe white paper.

a minority. While precise data on market shares would have been ideal, information was available only about the relative predominance of the Red Cross and blood banks in those countries where they share responsibility for the supply.

Germany is the only such "mixed" system where the Red Cross holds a majority. It is an unusual case in other respects also. First, as of 1989, it was the only EU country that obtained some of its blood from paid suppliers. Second, there is a mixed system of paid and unpaid donation within the nonprofit sector. Most hospital and community blood banks pay between DM 30 and DM 50 (about $18 to $30) per donation. (Government policy limits payment to a DM 50 maximum.) In some areas, Red Cross collection centers also compensate their donors. Third, regional governments (the various *Länder*) have different collection policies. There are also significant differences between Eastern and Western länder (Hagen 1993, pp. 74–75).

*Volunteer donor organizations.*—Donors are organized in one or more national groups in Denmark, France, Greece, Italy, and Spain. For example, Denmark's organization "was founded in 1932 when a boy-scout movement established a corps of young adult boy-scouts who on a voluntary non-remunerated basis were willing to be called to hospitals to donate blood" (Hagen 1993, p. 58). The Voluntary Blood Donors of Denmark supplies hospitals with donors. In return, hospitals pay the local organization a small fee per donation, which is used for publicity and further recruitment efforts.

Italy has a slightly different form of organization. It resembles a community blood bank model rather than a hospital blood bank. The difference is that instead of sending donors to hospitals, the organization collects the blood itself and sends it to hospitals. The majority of blood banks in Italy are run by one of three donor organizations. The largest is called Associazione Volontari Italiani del Sangue (AVIS) and claims about 800,000 members. The others are the Fratres and Federazione Italiana della Associazioni Donatori di Sangue (FIDAS), which also claim large memberships. They are organized in different parts of the country and do not compete with one another.[3]

By contrast, although France and Spain have a national and a bank-based system respectively, important donor organizations also exist in these countries. In my analysis, therefore, I distinguish between a blood-banking system and the presence of a voluntary donor group, even though in some countries the donor groups may have a hand in running the blood banks.

[3] Interestingly, this apparently strong voluntary activity contradicts the charge that Italy has no voluntary sector worth speaking of. See, e.g., Perlmutter (1991).

*For-profit plasma collection.*—Much of the debate about blood has contrasted the dangers of commercialism with the virtues of volunteering. While all blood suppliers sell blood products to hospitals or to one another, there is essentially no individual market for blood of the kind that existed in the United States in the 1960s. The commercial collection and processing of plasma is the main exception to this rule. Plasma can be extracted from whole blood or obtained separately through plasmapheresis.[4]

Plasma and whole blood collection overlap in complicated ways. In general, although nonprofit blood suppliers may collect plasma from voluntary donors, they do not process it any further. It is either used directly (as with whole blood) or sold to commercial plasma fractionators. Practices vary. Denmark, for example, has a state-run fractionation plant (although its capacity is small compared to the other, commercial plants in the country). The only exceptions of interest here are those countries where a company buys plasma directly from individual suppliers (rather than in bulk from regular blood suppliers who obtain it from donors). Spain and Germany both have such a system.[5]

## BLOOD DONATION: ORGANIZATIONS AND VOLUNTEERING

### Blood Donation as Voluntary Work

With this information about the structure of the EU's blood supply, we are in a position to work out some hypotheses about the effects of organizations on blood collection rates. We can think of blood donation as a special kind of volunteering that involves more than just money or time.[6] Indeed, the physical and symbolic nature of the gift of blood is what makes it attractive as the perfect example of altruistic giving. How similar blood donation really is to regular volunteering is partly an empirical question (which I examine below), but it is close enough to suggest that what we know about other kinds of volunteering might also apply to blood.

If blood donation falls under the rubric of volunteering in general, then a country's donation rate should line up with its rate of volunteering. Greeley (1997) discusses the best available data for Europe, which come from the 1991 wave of the European Values Survey (EVS). We can test

[4] Plasmapheresis takes longer than donating a unit of blood. It can also be done much more often: the body replaces lost plasma much faster than it does lost blood.

[5] The world market for plasma is dominated by the United States. A number of U.S. companies buy plasma from individuals, serving both domestic and export markets. The potential impact of a very large commercial plasma sector on donation rates is considered below, when I discuss the relationship of blood donation to volunteering.

[6] Lee, Piliavin, and Call (1999) find a weak positive correlation between giving blood and giving money or time.

the strength of the analogy between blood donation and other kinds of volunteering by comparing data from the two surveys.

HYPOTHESIS 5.—*Countries with high rates of voluntary activity in general will also have high rates of blood donation.*

Greeley also notes that "church attendance and membership in religious organizations correlate with volunteering [in Europe]. . . . Even in countries where religious activity is not high, as in the Scandinavian countries, religious behavior still has a significant impact on voluntary service" (Greeley 1997, p. 71). His data, together with other research (Wuthnow 1991*a;* Chaves 1998), suggest that involvement in organized religious activity encourages both religious and secular forms of volunteering. The same should be true for blood donation. I use the survey's measure of church attendance to test this hypothesis.

HYPOTHESIS 6.—*People involved in religious organizations will be more likely to donate blood.*

## Blood Collection and Organizational Scope

In general, blood is collected by public or nonprofit organizations that solicit voluntary donations from individuals. Why might some forms of organization be better than others at doing this? Research on how organizations solicit money shows that rates of giving tend to increase with age. Educational attainment also usually has a positive effect (Clotfelter 1993; Hodgkinson and Weitzman 1992; Jencks 1987). But the most consistent finding in this literature is organizational rather than individual: being asked to contribute is one of the most important determinants of giving in general (Hodgkinson and Weitzman 1992; Piliavin and Charng 1990). And although there are better and worse ways to ask, simply giving someone the opportunity to volunteer can be decisive. A survey of American blood donors carried out in 1975 confirms this general finding. As in other studies, when asked why they gave blood, donors tended to give altruistic reasons. But when nondonors were asked why they had never donated, the two most common responses were "I was never asked" and "There was no convenient opportunity" (Drake et al. 1982, pp. 76–113). Poor organization—rather than selfish motivation—kept people from giving.

We should expect some collection regimes to do better than others depending on the opportunities for giving that they offer. Larger, better-funded organizations will be in a position to publicize their needs more than smaller, more disaggregated ones. The publicity efforts of large organizations also benefit from economies of scale and from name recognition and the trust they engender. (The Red Cross symbol is instantly recognized the world over.) Large organizations may also find it easier to coor-

dinate effective recruitment drives. Costs can be redistributed from easy-to-recruit to costly-to-recruit regions. For these reasons, in our case, we should expect the Red Cross to be better than blood banks at attracting donors.

If simply reaching potential donors is important, then countries where the state has a monopoly on collection should do best of all. Other things being equal, a national system is more likely to be better funded, have a wider coverage, and have more recruitment options open to it than other kinds of organization. Operating within a national health system, the blood-collection organization should find it easier to integrate its activities into the general package of benefits provided by the state. Giving blood might more easily be seen as part of a general quid pro quo, part of the individual obligation incurred by the public goods provided by the state. State systems should also have an easier time getting access to other state organizations where donors might be found (such as universities, the civil service, and so on). The resources to run large-scale recruitment efforts may also be more easily available to state-run collection agencies.

HYPOTHESIS 7.—*National health systems will attract the most donors, followed by Red Cross systems.*

Blood banking systems are by nature more disaggregated than either state or Red Cross systems. The collection regime is made up of a number of blood banks, often tied to local hospitals, usually self-administered, and always serving some local population. This does not imply that blood banks will do worse than larger alternatives, although they should show more variation. Some local banks will be better run than others. In addition, blood banks offer a wider range of incentives to donors than either Red Cross or state systems. Some use an insurance system, where donors build up credit for their own operations by donating regularly themselves. Banking systems are also more likely to offer autologous donations, where patients build up a stock of their own blood solely for personal use. This variability in organizational style and incentive systems should be reflected in collection rates.

HYPOTHESIS 8.—*Blood banking systems will show the widest range of variation in donation rates.*

What about effects of commercialism? Titmuss argued that paid suppliers would drive out volunteers. Given that the blood supply today is essentially voluntary, it is difficult to test this claim. The best we can do is to examine whether countries with a commercial plasma sector differ from those without one. Because the plasma supply may be commercialized, but whole blood collection almost never is, the opportunity to voluntarily donate always exists. By Titmuss's logic, we should therefore expect some specialization by income.

HYPOTHESIS 9.—*In countries with a commercial plasma supply, the poor will be more likely to sell their plasma than donate their blood.*

Conversely, five countries in the sample (Denmark, France, Greece, Italy, and Spain) have donor organizations that are committed to the ideal of altruism. We saw that one of the main findings in studies of individual donors is that, while there is a "modal donor," many who fit the profile do not donate. I suggest that donor organizations will find it easiest to recruit from this group of nondonors. Thus, if the modal donor is a well-educated male, a donor group will find it easiest to recruit the many well-educated males who would not otherwise donate. These groups will skew the donor population toward the modal profile, rather than increasing the odds of donation for atypical individuals.

HYPOTHESIS 10.—*Where a donor organization exists, people already likely to donate blood will be even more likely to do so, but those already unlikely to donate will be less likely to do so.*

## DATA AND METHODS

### The Survey

I analyze the Eurobarometer survey carried out in the European Union, along with Norway and Finland, in 1994 (Reif and Marlier 1996). The survey contains data on blood donation across Europe. Respondents were asked a battery of questions about blood and plasma donation. People were asked for their opinion about the way blood and plasma are collected and handled, their reasons for donating and not donating, their understanding of the differences between blood and plasma, and their attitudes about buying and selling blood.

The survey sampled persons ages 15 years and over residing in the 12 member states of the European Union, as well as Norway and Finland. It was carried out through multistage national probability samples and national stratified quota samples during March through June of 1994. The complete data set contains 540 variables and 19,477 cases. In all, there are 31 questions about blood donation and related issues. Finland is not included in the analysis because all blood-related data for this country were missing.

### Models and Variables

I first present the results of a series of logistic regression models for each country. In each case, the dependent variable measures whether the respondent has given blood in the last year (coded "1" for yes, "0" for no; overall, about 7% of the respondents had done so). I also report results for

a mixed-effects model of the pooled data, where the dependent variable is whether the respondent has ever given blood.[7]

The independent variables in the model represent characteristics of individual donors and institutional environments. The former are recoded from the survey. The latter were obtained from the interview data detailed in Hagen's (1993) Council of Europe white paper. Scores for institutional variables were attributed to each observation using the country codes in the data set.

The institutional setting is represented by three variables: First is the kind of collection system a country operates. Countries with state-run systems make up the omitted category. The coding corresponds to table 2. Second is a binary variable registering the presence of a volunteer donor group in a country. Individuals from countries with such groups (Denmark, France, Greece, Italy, and Spain) are coded "1," others are coded "0." Third is the presence of a commercial plasma operation (where individual suppliers are paid for plasma). Because only two countries (Germany and Spain) fall into this category, it is not included in the general model. Instead I examine how pooled results for these two countries differ from the average.

The individual-level variables are described in table 3. They have been coded with reference to the "modal donor" reported in the research studies described above. The network variable is constructed from a series of questions where respondents were asked to say whether they themselves had ever received a blood transfusion or whether they knew of a family member or a friend who had ever gotten one. The variables have been centered in order to give a substantive interpretation to the intercept term in the models. Age has been centered on 35 year olds and education on those with 16 years of full-time education. Income has been centered on the top quartile threshold. The intercept therefore represents a nonattending 35-year-old male in the top income quartile, with (roughly) a college education and no network ties to transfusion recipients.

I first specify a model with individual-level variables only, which I

[7] The dependent variable for the mixed-effects model is "ever given" rather than "given in the last year" for two reasons. First, very few respondents had given blood in the previous year, which made fitting the model difficult. (It became overparameterized easily, with the addition of interaction terms and country-level random effects.) The "ever given" variable has a larger number of respondents. This is not ideal, but across countries, the two variables are highly correlated ($r = 0.91$). Second, from a substantive point of view, the two variables offer a more differentiated picture of the donor pool when taken together. It enables us to see that some systems recruit a large number of one-time donors, whereas others keep a smaller pool of regular volunteers.

TABLE 3

DESCRIPTION OF INDIVIDUAL-LEVEL VARIABLES

| Variable | Description |
|---|---|
| Female | Coded "1" for female, "0" for male |
| Age | Age in years; centered on 35 year olds |
| Education | Years of full-time education; centered on respondents with 16 years of full-time education |
| Income | Eurobarometer's comparative income variable, ranging from 1 (lowest) to 12 (highest); this variable harmonizes income scores measured in different currencies |
| Attend | Measures whether the respondent regularly attends a church; values range from 0 (never attends) to 4 (attends daily) |
| Network | A four-category code measuring contacts with transfusion recipients (including oneself); values range from 0 (no ties) to 3 (ties to self, relative, and friend) |

apply to each country in turn. Under this model, the log odds of individual $i$ in country $j$ ever having given blood are

$$\log\left(\frac{p_{ij}}{1 - p_{ij}}\right) = \beta_{0j} + \beta_{1j}F_{ij} + \beta_{2j}A_{ij} + \beta_{3j}E_{ij} + \beta_{4j}I_{ij} + e_j, \qquad (1)$$

where $p$ is the probability of having given blood in the past year; $F$, $A$, $E$, and $I$ are scores for female, age, education, and income variables; the $\beta$s are unknown regression coefficients; and $e$ is the error term. In this equation, the subscript $j$ on the $\beta$s indicates that the individual effects are allowed to vary by country (i.e., we specify a separate regression for each country). This model allows us to see the extent of individual-level variation across countries.

For a stronger test of the institutional effects, I estimate a generalized linear mixed-effects model for the pooled sample. The institutional variables for collection regime and donor group are included and interacted with the individual-level variables. The interaction effects can be interpreted as showing how different institutional mechanisms modify the effect of individual characteristics on donation.

A standard logistic model assumes that each observation is sampled independently. This is not appropriate for a pooled sample where responses are clustered by country. The mixed-effects model used here specifies a country-level random effect to account for the fact that observations from the same country are not properly independent of one another. Re-

sults will tend to be more conservative than in the usual regression model. The log odds of individual $i$ in country $j$ ever having given blood are

$$\log\left(\frac{p_{ij}}{1 - p_{ij}}\right) = X_{ij}\beta + \alpha_j, \tag{2}$$

where $X$ is a vector of independent variables and $\alpha$ is a random effect that varies across countries. Substantively, the random effect accounts for unmeasured factors associated with each country, thereby providing a more conservative estimate of the institutional-level variables, which vary across countries.

## RESULTS

### Individual Variation by Country

Table 4 shows the results from a series of logistic regressions where five individual-level variables were regressed on the donor variable (had the respondent given blood in the last year) for each country in the sample. Countries are grouped by regime type. The variables test predictions about individual donors (hypotheses 1–4 above) and also indicate the range of cross-national variation in the donor profile.

Hypothesis 1 is broadly confirmed by the data. Men everywhere are more likely to donate than women, and the odds of donating decline with age. The uniformly negative age coefficients indicate that each additional year after the age of 35 reduces one's probability of being a donor by between 2% and 6%. This is especially the case in state-run systems. The gender gap in donation is quite variable. Women may be as little as 3% or 4%, and as much as 70%, less likely to donate, depending on the country involved. (I return to this variability when I discuss hypothesis 8, below.)

Hypotheses 2 and 3 predict that the odds of donating increase with educational attainment and income, respectively. These claims do not seem to be supported by the data. France and Norway are the only two countries where higher educational attainment makes donation more likely. In all of the Red Cross countries, the education coefficients are actually negative (though not significant). Higher income significantly raises the probability of donation in five countries in the sample (Ireland, Belgium, Denmark, Norway, and Portugal).

Does the absence of strong education and income effects imply that previous studies are in error? An explanation is that while giving blood is indeed positively associated with these variables, very few people have given blood in the past year. If we regress the same independent variables in table 4 on a measure of whether the respondent has *ever* given blood,

TABLE 4

LOGISTIC REGRESSION ON DONOR VARIABLE: INDIVIDUAL-LEVEL EFFECTS BY COUNTRY

| Country | Intercept | Female | Age | Education | Income | Network | Attend | *N* |
|---|---|---|---|---|---|---|---|---|
| National systems: | | | | | | | | |
| Britain | −2.506*** | −.123 | −.046*** | .017 | .007 | −.094 | .155 | 383 |
| | (−4.08) | (−.54) | (−3.04) | (.17) | (.10) | (−.29) | (.75) | |
| France | −1.620*** | −.064 | −.027** | .142** | .055 | .172 | .034 | 527 |
| | (−5.39) | (−.43) | (−2.45) | (2.97) | (1.07) | (.85) | (.23) | |
| Ireland | −3.331*** | −.334* | −.048*** | −.173 | .130* | .053 | .154 | 475 |
| | (−4.13) | (−1.75) | (−3.03) | (−1.53) | (1.89) | (.17) | (.72) | |
| Red Cross systems: | | | | | | | | |
| Belgium | −4.243*** | −.354 | −.024 | −.018 | .206** | .166 | .749* | 341 |
| | (−4.70) | (−1.13) | (−1.17) | (−.15) | (1.98) | (.39) | (2.28) | |
| Luxembourg | −4.363*** | −.888** | −.026 | −.088 | .121 | −.106 | .660* | 314 |
| | (−5.60) | (−2.70) | (−1.30) | (−1.10) | (1.43) | (−.31) | (2.41) | |
| The Netherlands | −3.270*** | −.200 | −.027* | −.028 | .093 | .502* | .417* | 347 |
| | (−5.93) | (−1.03) | (−1.93) | (−.52) | (1.55) | (1.86) | (2.18) | |
| Germany | −3.737*** | −.417** | −.029** | −.023 | .056 | .730*** | .285* | 907 |
| | (−9.27) | (−2.67) | (−2.79) | (−.56) | (1.05) | (3.47) | (1.77) | |
| Banking systems: | | | | | | | | |
| Denmark | −1.918*** | −.063 | −.019* | −.022 | .104** | .090 | −.049 | 561 |
| | (−5.80) | (−.43) | (−1.82) | (−.64) | (2.08) | (−.44) | (−.25) | |
| Norway | −1.86*** | −.033 | −.023 | .042* | .159** | −.015 | −.432 | 469 |
| | (−4.37) | (−.15) | (−1.47) | (1.64) | (2.21) | (−.05) | (−1.48) | |
| Italy | −3.172*** | −.593** | −.042*** | −.027 | −.017 | −.409 | .324 | 566 |
| | (−4.90) | (−2.74) | (−3.18) | (−.55) | (−.25) | (−1.27) | (1.50) | |
| Greece | −2.06*** | −1.022*** | −.047*** | .026 | .064 | .108 | .042 | 687 |
| | (−4.22) | (−5.69) | (−4.64) | (.75) | (1.16) | (.45) | (.21) | |
| Spain | −2.499*** | −.106 | −.027* | .040 | .022 | .226 | .0271 | 477 |
| | (−5.31) | (−.55) | (−1.91) | (.83) | (.34) | (.74) | (.16) | |
| Portugal | −4.629*** | −.806*** | −.013 | −.011 | .168** | .834** | .211 | 718 |
| | (−5.95) | (−3.18) | (−.85) | (−.22) | (1.98) | (2.01) | (.88) | |

NOTE.—*t*-values are given in parentheses below coefficients.

* $P < .1$.

** $P < .05$.

*** $P < .01$.

then we find both income and education have positive, significant effects in most countries (though their effects remain weaker under Red Cross systems).[8]

Hypothesis 4 predicts that knowing people who have received a transfusion has a positive effect on the odds of donating. This is true for the Netherlands, Germany, and Portugal. Respondents from these countries who knew one or more transfusion recipients were between 1.6 and 2.3 times as likely to have given blood in the previous year. As with income and education, however, this effect is greatly increased if we look at those who have ever given blood rather than those who have given recently. In this case, having a network connection to a transfusion recipient is significant in seven of the thirteen countries. While knowing a transfusion recipient may provoke you to give blood (perhaps around the time of their operation), it is not nearly as likely to turn you into a regular donor.

## Blood Donation and Regular Volunteering

It takes some effort to go and give blood. As such, donation should be positively related to similar activities more than to general attributes such as educational attainment. Hypotheses 5 and 6 link blood donation to involvement in religious organizations and other kinds of voluntary activity.

Hypothesis 5 predicts that countries with high rates of volunteering will also have high rates of blood donation. To test this, I compared national volunteering rates calculated from the 1991 EVS to blood donation rates calculated from the data analyzed in this article.[9] Across all countries, there is no correlation ($r = -0.004$) between the volunteering rate and the proportion of the population who had given blood in the previous year. Contrary to the view that sees it as the perfect example of such behavior, this result suggests that blood donation is not the same sort of activity as regular volunteering at all.

The picture is subtler than this, however. Hypothesis 6 predicts that church attendance increases the likelihood of donation, just as it increases other kinds of volunteering. Here we find a surprising pattern. Regular

[8] Results available on request.

[9] I recalculated the rates reported in Greeley (1997) using an EVS question that asked the respondent if they did unpaid work for one of 16 kinds of voluntary organizations, ranging from church organizations and trade unions to sports, animal rights, community action, and other groups. The volunteering rate is the proportion of the population that did unpaid work for at least one of these activities. It ranges from a low of 7.6% in Spain to a high of 35.6% in Norway. The comparable statistic for the United States (from the same survey wave) is 47%.

church attendance positively and significantly raises the likelihood of donation in every country where the Red Cross runs the blood supply, but nowhere else. Regular attenders in Red Cross countries are between 1.3 and 2.1 times more likely than average to have given blood in the past year. The effect of attendance is not significant under other systems. (Indeed, it is negative in Norway and Denmark.)

This finding indicates that the Red Cross uses a collection strategy that directly or indirectly selects for religiously active people (who are also more likely to volunteer). One could interpret these results as saying that the Red Cross organizes its blood collection through religious organizations. Indeed, it is true that blood drives often target church congregations—this is an ordinary but important way in which altruism is evoked and sustained by blood collectors.

But blood banks and state systems also avail of this strategy. The Red Cross is distinctive in other ways. It is a secular organization founded on humanitarian principles, and it does not affiliate with particular religions. Each national organization maintains an extensive network of local branches that do many different kinds of social service and relief work in addition to blood collection. The Red Cross uses its own organizational structure to independently recruit people who also tend to be involved in other voluntary activities. Structurally, the Red Cross is more like other large voluntary organizations than either a state agency or a blood bank. It integrates blood donation into a wider range of voluntary activities, recruiting and keeping volunteers as it goes. This is not true of state systems, where blood collection is part of the national health service and thus institutionally isolated from other kinds of volunteering; and it can be only partly true of banking systems, which are much more limited in scope than the Red Cross and often use incentives that go against a strictly voluntary ethos.

The data support this interpretation. In Red Cross countries, the general volunteering rate (measured by the EVS) and the blood donation rate are strongly correlated ($r = 0.81$), though we saw above that there is no association between them in general.[10] If we look at the proportion of donors who say they have given blood many times, we find that countries where the Red Cross has a monopoly on collection outscore all of the state systems and all but two of the banking systems. Red Cross systems maintain a pool of regular volunteers, whereas state systems adopt a more extensive approach. France and Luxembourg provide a good contrast here. France has the most donors, with 44%; Luxembourg the fewest, with

[10] The corresponding correlations for the other regimes are $r = 0.28$ (state systems) and $r = -0.13$ (blood banks).

14%. But only 33% of French donors have given many times, compared to 53% of donors in Luxembourg.

## Institutional Effects

The country-level results discussed so far strongly suggest that institutional variation has important effects on the blood supply. To make a stronger test of this claim, I analyzed the pooled sample in a mixed-effects model (with a random effect for each country), keeping the individual-level variables as before and adding a number of institutional-level ones. The organizational variables are interacted with the individual ones. The dependent variable is whether the respondent has ever given blood.[11]

The results from this model are reported in table 5. The first column of coefficients shows the main effects of each of the variables in the model (reported in logits, as before). The other four columns show the interaction effects, which model the effects of the institutional conditions on the individual characteristics. Thus, −0.333, the first number in the second column, shows the additional effect of being female under a Red Cross system.

The main finding from this model is that, as the country-level analysis strongly suggested, donation patterns in Red Cross and state regimes differ significantly from one another. For the individual effects, the female and education coefficients show that Red Cross regimes have a significantly wider gender gap than state regimes but that they reduce the effect of education. The network variable is also (and only) significant under a Red Cross regime, suggesting that the Red Cross is better able to capitalize on people's ties to transfusion recipients than its state or banking counterparts.

Hypothesis 6 receives further support from the mixed-effects model. Regular church attendance significantly increases the chances of ever having given, but only under a Red Cross regime. This again supports the claim that Red Cross regimes use collection strategies that select for regular church attenders, thus making blood donation more like other forms of volunteering.

Hypothesis 7 predicts that state-run systems will collect the most blood, followed by Red Cross systems. From our findings about volunteering, we can now see that this is an ambiguous claim. The mixed-effects model shows that state regimes will indeed have more donors in their population than Red Cross systems. The Red Cross main effect is significantly nega-

[11] Note that this means the interpretation of the age coefficient is different from before. It captures the now inevitably increasing effect of age on one's chances of ever having given blood.

TABLE 5

MIXED-EFFECTS MODEL OF INDIVIDUAL- AND INSTITUTIONAL-LEVEL VARIABLES ON DONATION RATES BY COLLECTION REGIMES

| | | Interaction Effects | | |
|---|---|---|---|---|
| Variables | Main Effect | Red Cross | Blood Banks | Donor Groups |
| Intercept | .111 | | | |
| | (.34) | | | |
| Female | −.471*** | −.333** | −.402*** | −.305** |
| | (−3.70) | (−1.96) | (−2.64) | (−2.05) |
| Age | .005 | −.008 | .004 | −.003 |
| | (1.14) | (−1.44) | (.76) | (−.56) |
| Education | .085*** | −.066** | −.052** | −.007 |
| | (3.41) | (−2.26) | (−2.06) | (−.42) |
| Income | .112*** | −.044 | −.020 | −.033 |
| | (5.20) | (−1.55) | (−.78) | (−1.32) |
| Network | .127 | .353*** | −.097 | .086 |
| | (1.36) | (2.90) | (−.89) | (.80) |
| Attend | .102 | .101** | −.077 | .028 |
| | (1.61) | (2.49) | (−1.29) | (.36) |
| Red Cross | −.707* | | | |
| | (1.67) | | | |
| Blood bank | −.320 | | | |
| | (−.83) | | | |
| Donor group | 1.044*** | | | |
| | (2.88) | | | |

NOTE.—Valid $N$ = 6,904; scaled deviance = 7,405; scaled Pearson $\chi^2$ = 6,867; $t$-statistics are given in parentheses.

* $P < .1$.

** $P < .05$.

*** $P < .01$.

tive, indicating the lower likelihood of being a donor under that system. But the dependent variable here is whether the respondent has *ever* given blood. State regimes therefore have more donors in this "extensive" sense: they are more likely to have persuaded people to donate at some point in their lives. But Red Cross regimes have more regular donors. They represent a more "intensive" strategy: although they recruit fewer donors, they are better at keeping them on as regular volunteers.

Hypothesis 8 predicts that blood banks will show the widest range of variation in donation rates. The intercept terms in table 4 bear this out. State regimes are clustered amongst the higher values; Red Cross regimes are amongst the lower. (The significantly negative main effect of the Red Cross variable in the mixed effects model reflects this clustering.) But both the lowest (Portugal) and second-highest (Norway) values are found in

banking systems. Denmark and Norway have the highest number of donors who say they have given many times. The other banking systems are at the bottom of the scale.

This variation is most obvious for gender. Italy, Greece, and Portugal show particularly large differences between men and women. Italian women are only about a third as likely as their male counterparts to have donated within the previous year. In Greece and Portugal, women are only 40% to 60% as likely as men to have donated. But, again, Denmark and Norway have no significant gender gap. Banking regimes are split on a geographical axis, with the Scandinavian systems doing well and the Mediterranean ones doing badly. This suggests that broader (perhaps cultural) features of these societies are responsible for the wide gender gap.

Hypothesis 9 predicts that where a commercial plasma supply exists the poor will be more likely to sell their plasma than donate their blood. This claim is difficult to test given the data, but there is some support for it. We have seen that income has a broadly positive effect on donation. If we separate out respondents in the bottom income quartile, we find that they are everywhere less likely to donate their blood than those with higher incomes. In Spain and Germany, the two countries where it is possible to sell one's plasma, this effect is larger than average. The opportunity to sell plasma does reduce one's likelihood of giving blood. However, the data do not allow us to say conclusively whether the poor sell their plasma more than the rich: too few respondents have ever given plasma, and we cannot distinguish between those who sold it and those who donated it.

Finally, hypothesis 10 predicts that donor organizations increase the likelihood of donation, but only for those who are already likely to give. We find that respondents were more than 2.8 times as likely to have ever donated if a donor organization existed in their country. We also find that where donor groups exist, women are 25% less likely to have given, over and above the other individual and institutional variables controlled for in the model. But the presence of a donor group did not significantly change the effect of the other individual variables. Thus, donor groups do significantly increase the number of donors, but they also make it more likely that the new recruits will be men rather than women.

## DISCUSSION

It is easy to see why blood donation is thought of as an exemplary act of altruism. What could be more selfless than giving away one's own blood to a stranger in need? Yet it is an odd kind of gift, for it cannot be given away as we might hand money to a needy stranger. It must instead be

collected by a specialized organization and distributed on our behalf. In a way, this only increases the altruistic significance of donation, as it means donors cannot know or be thanked by those who receive their blood. But it also makes blood collection an organizational problem rather than an individual action. With the exception of Titmuss's pioneering effort of 30 years ago, the role of institutions in producing volunteer donors has not been studied comparatively.

This article outlined the range of organizational variation in European blood collection and showed its effects on donation. We find that state systems have a larger than average donor base, concentrated in a male population of relatively high socioeconomic status. Countries with Red Cross systems, by contrast, tend to have fewer donors, and educational attainment and income have less of an effect. Countries with a blood-banking system show the widest range of variation in donation rates. Volunteer donor groups increase the size of the donor pool but recruit more men than women as they do so.

The analysis also revealed a surprising pattern with broader implications for our understanding of volunteering and altruism in general. Collection regimes do not simply increase or decrease the donation rate along a sliding scale. They shape the kind of activity that blood donation is. The analysis suggests that under a state regime, blood donation is something that people are likely to do once or twice, probably when they are students or during a large collection effort. Under a Red Cross regime, blood donation is coordinated by a large voluntary organization that recruits a smaller group of regular donors. This more committed donor pool is likely to be made up of church-attending people who are involved in other voluntary activities. State systems pick up donors more extensively but do not retain them as successfully. Nor do they tap into the potential relationship between blood donation and other forms of volunteering or the ties of donors to those in need of blood. Under Red Cross systems, then, blood donation really is the exemplar of altruism it has always been thought to be—but this is because the collection regime has made it so, not because of the act itself or the strictly individual qualities of donors.

Future research should attend to how collection regimes influence the amount of blood collected and to how their collection strategies affect the meaning of donation. It is surprising that so little systematic data is available on the amount of blood collected each year in Europe or the United States. There is very little monitoring of the procurement or traffic in blood and blood products, despite its medical and social value (General Accounting Office 1999, p. 3). Note also that this lack of data makes it difficult to address the relationship between blood collection and blood usage. This article examined the "supply side" of the blood market. Blood is difficult to collect, so supply bottlenecks might determine usage levels.

But it might also be that medical conventions for blood use vary by country and that demand for blood varies along with them. Further research is needed here.

As for blood donation and volunteering, more qualitative data is required from specific countries. Rich information on particular regimes has yet to be collected. This line of research would carry the valid kernel of Titmuss's project into the largely noncommercial contemporary environment. Such data would allow us to further investigate the link between blood donation and volunteering identified in this article, as well as to examine the place of similar products such as human organs and genetic material. The organizational approach presented here should also be complemented by an analysis of the cultural work involved in exchanging goods of this sort, both societally and in specific interactions (Zelizer 1985, in press; Espeland 1984).

Comparative social scientists have long been aware that markets of all kinds are deeply embedded in different national contexts and that these differences can drive variation in key economic variables. This article shows that we can apply this insight to altruistic as well as self-interested exchange. How you organize a blood supply system not only affects how much you collect and who you get it from, it shapes the character of donation. Collection regimes can make blood donation work like other forms of giving, or they can make it quite unlikely that a donor will give more than once. Individuals may be moved to give their blood for any number of reasons, but it is the collection regimes that give individuals the chance to donate in the first place. Collection regimes embed altruism by creating opportunities to give. In the process, they produce differing donor populations and show us that there is more than one way for a society to rely on the kindness of strangers.

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