

NBER WORKING PAPER SERIES

THE DETERMINANTS OF THE WILLINGNESS
TO BE AN ORGAN DONORNaci Mocan
Erdal TekinWorking Paper 11316
<http://www.nber.org/papers/w11316>NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 2005

We thank Umut Ozek and Sudapej Ksrisuwan for excellent research assistance. The views expressed herein are those of the author(s) and do not necessarily reflect the views of the National Bureau of Economic Research.

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Naci Mocan and Erdal Tekin
NBER Working Paper No. 11316
May 2005
JEL No. I0, I1

ABSTRACT

The total value of life lost due to death because of waiting for an organ transplant is greater than \$4 billion annually in the United States, and the excess demand for organs has been increasing over time. To shed light on the factors that impact the willingness to donate an organ, we analyze data from the United States and the European Union. The rate of willingness to donate an organ is 38 % among young adults in the U.S., and it is 42 % in Europe. Interesting similarities emerge between the U.S. and Europe regarding the impact of gender, political views and education on the willingness to donate. In the U.S. Blacks, Hispanics and Catholics are less likely to donate. In Europe, individuals who reveal that they are familiar with the rules and regulations governing the donation and transplantation of human organs are more likely to donate. In both data sets individuals who had some encounter with the health care sector –either through a recent emergency room visit (in the U.S.), or perhaps because of a long-standing illness (in the E.U), are more likely to become organ donors. Mother’s education has a separate positive impact.

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The Determinants of the Willingness to Donate an Organ: Evidence from the United States and the European Union

I. Introduction

Because improvements in surgical technology and transplant immunology vastly increased the success rates of organ transplantation, an excess demand for organs has emerged, and the median waiting time for an organ has been increasing over time. Between 1995 to 2000, the number of patients waiting for organ transplantation increased by 80 percent, while the number of cadaveric donors grew by less than 12 percent (U.S. Department of Health and Human Services 2002). As of February 2005, 94,307 individuals were on the waitlist for an organ transplant in the United States, and in 2004, 6,279 individuals died while waiting for organ transplant (Organ Procurement and Transplantation Network, April 2005). This suggests that the value of lost life due to insufficient supply of organs exceeds \$4.5 billion in 2004.¹

The legal foundation for removal of organs for transplantation is provided by the Uniform Anatomical Gift Act (UAGA) in the U.S., which has been passed in some form in all states by 1972. The law allows adults to declare whether they wish to donate their organs after their death (Spital 1996, Capron 2001). As detailed in Capron (2001), a 1981 committee, which included the American Medical Association, a presidential commission, the National Conference of Commissioners on Uniform State laws, and the American Bar Association, proposed the Uniform Determination of Death Act, which set the standard for determining death; and within a few years all but three states adopted the statute (Capron and Cade 2000). In 1984, the adoption of National Organ Transplant Act

¹ Using the median value of a statistical life in the United States (Viscusi and Aldy 2003).

reinforced the basic tenet of UAGA and provided clarifications for the process of donating and transplantation (Capron 2001).

The laws in almost every state in the United States indicate that the information revealed on donor cards and driver's licenses are legally binding. However, it has been demonstrated that physicians and organ procurement organizations (which are private institutions that are responsible for all cadaveric organ procurement within their designated areas) still seek the consent of the deceased person's family (Ramalingam, Gordon and Ross 2001, Wendler and Dickert 2001, Spital 1996). Consequently, research has focused on the investigation of the factors that determine a family's consent for procurement (Sheehy et al. 2003, Wendler and Dickert 2001, Siminoff et al. 2001).

A number of mechanisms have been proposed that aim to reduce or eliminate the disequilibrium where the demand for organs exceeds supply. Examples of non-controversial proposals are public education and awareness campaigns. Other proposals to increase the supply of organs include implementation of policies such as mandated choice (Chouhan and Draper 2003), or presumed consent such as the case in Spain (Bosch 1999, Abadie and Gay, 2004). More controversial ideas include creation of a spot or futures market for organs, where financial incentives are provided to potential donors².

Policies targeted to increase the rate of donations are useful avenues to increase the supply of organs. Two recent studies have shown that the consent rate of families was 54 percent and 56 percent, respectively, in two different samples (Sheehy et al. 2003, Siminoff et al., 2001), which suggests that there is room to increase families' consent by

² See Cohen (1989), Hansmann (1989), Radcliffe-Richards et al. (1998), Evans (2003), Byrne and Thompson (2001), and Goyal et al. (2002) for discussions of issues surrounding market-based solutions to organ shortage.

designing more effective procedures in terms of interaction of families and medical professionals.

It is also documented that families are much more likely to consent to organ donation if they knew that the patient had a donor card (Siminoff et al. 2001). Furthermore, 31% of the organ procurement organizations indicate that they follow the deceased's wishes regardless of next of kin's preferences. This information is significant, because it suggests that there may be substantial gains from increasing the rate of willingness to donate among overall adult population. For example, it is estimated that the annual number of brain-dead potential organ donors was between 10,500 and 13,800 during 1997-1999 (Sheehy et al., 2003). If within this group of individuals the rate of organ donation willingness (as revealed by a donor card) was 5 percentage points higher than actual, this would suggest that an additional 525 to 690 people would be included in the pool of brain-dead potential organ donors with an organ donor card. Given that 31% of the organ procurement organizations honor the deceased's wish regardless of the opinion of the family, the actual number of deceased donors would go up by at least 163 to 214. Because there were about 5,800 deceased donors in 1998, this would imply a 3-to-4 % increase in actual donors.

Despite the importance of the subject, little is known about the characteristics of potential organ donors. Our investigation of the literature has revealed that the previous research on the subject is mostly either theoretical, or empirical with nonrandom or geographically limited samples. This is likely to be due to a lack of organ donation information in most well-known nationally representative data sets. In this paper we document the determinants of the propensity for the willingness to become an organ

donor using large representative random samples from the United States and the European Union. We find interesting individual characteristics that influence the propensity to become a donor, some of which lend themselves to public policy. We also find a high degree of consistency in donor attributes between the United States and the European Union.

In order to address the shortage of organ donation, the Department of Health and Human Services in the United States has been implementing programs to educate the public and to raise awareness on the subject. By providing insights into the individual determinants of organ donation and by highlighting the characteristics of potential organ donors, this paper will have potential implications for these efforts. The paper is organized as follows: Section II describes the data sources and empirical methodology. Section III presents the results, and section IV is the conclusion.

II. Sources of Data and Empirical Analysis

We employ two large data sets for the empirical analyses. For the United States, we use the third wave of the National Longitudinal Study of Adolescent Health (Add Health). The Add Health is the largest and most comprehensive nationally representative survey of adolescents ever undertaken.³ The first wave of Add Health was administered

³ The Add Health project is a program project designed by J. Richard Udry (PI) and Peter Bearman, and funded by grant P01-HD31921 from the National Institute of Child Health and Human Development to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute on Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, NIH; the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, DHHS; the National Center for Health Statistics, Centers for

between September 1994 and April 1995 to 20,745 nationally representative set of adolescents in grades 7 through 12. An in-school questionnaire was given to every student who attended one of the sampled 132 U.S. schools on a particular day during the period between September 1994 and April 1995. A random sample of approximately 200 adolescents from each high school/feeder school pair was selected for in-home interviews.⁴ The adolescents are interviewed for the second time in 1996 for Wave II, and 15,170 of the original Wave I respondents were interviewed again between August 2001 and April 2002 for Wave III.⁵

We use the data from Wave III, where the individuals are in the age range of 18 to 28. In Wave III, each young adult was asked whether he/she was a registered organ donor. The data also include information about personal characteristics of the individual, such as age, race, ethnicity, education, marital status, religiosity, political affiliation, whether he/she was born in the United States. Also included is information about income, health status, mother's education, emergency room visits, hospital stays, and whether the individual had an accident in the past. An interesting question pertains to the individual's past volunteer activity. In particular, each individual was asked whether he/she participated in volunteer or community service work when he/she was 12

Disease Control and Prevention, DHHS; the Office of Minority Health, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation. Persons interested in obtaining data files from The National Longitudinal Study of Adolescent Health should contact Add Health Project, Carolina Population Center, 123 West Franklin Street, Chapel Hill, NC 27516-2524 (email: addhealth@unc.edu).

⁴ Participating high schools were asked to identify junior high or middle schools that were expected to provide at least five students to the entering class of the high school. These schools are called feeder schools. Their probability of selection was proportional to the percentage of the high school's entering class that came from that feeder.

⁵ There are about 5,500 cases excluded from Wave 3 for various reasons including moving out of country, active military duty, incarceration and being institutionalized, death, and failure to locate in repeated attempts.

to 18 years of age as required by parents, school or religious groups. This question will allow us to investigate the extent to which learned altruism has an impact on future altruistic behavior as evidenced by having a donor card.

The descriptive statistics of the U.S. data are displayed in Table 1. The first column presents the means and standard deviations of the variables in the whole sample. Columns II and III provide the same information for donors and non-donors, respectively. About 36 percent of the sample indicate that they are registered organ donors. When we calculated the average organ donation willingness using sample weights to arrive at the population mean, we obtained a rate of about 38 percent. The average age of the sample is about 22, and 47 percent of the sample is male. Nine percent of the sample indicate that they were required to do volunteer work or community service by parents, school or religious group work when they were young. *Healthy* is a dichotomous variable, equal to one if the answer to the question “In general, how is your health?” is good, very good, or excellent.

Fifteen percent of the sample reported having been injured by an accident or having being seen by a doctor because of an accident in the past 12 months. Fifty-eight percent of the sample has been seen in an emergency room during the last five years, and 27 percent of the sample has been admitted to a hospital over the last five years for at least a one-night stay. Eighteen percent of the sample indicate that their political persuasion is liberal, and about 53 percent identify themselves as being in the middle of the political spectrum (Middle-of-the-road). Sixteen percent do not work or go to school. About 14 percent attend school only with no labor market activity, and 24 percent go to school and work at the same time.

The data for the European Union is obtained from The Eurobarometer survey series (58:2), the European Commission, Directorate-General Press and Communication, Public Opinion Analysis Sector. The survey is conducted between October-December 2002, based on multi-stage national probability samples of the citizens of the European Union aged 15 and over, residing in 15 European Union member countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and United Kingdom.) The donation question was asked as follows: “Whatever the rules and regulations, would you personally be prepared to donate one of your organs to an organ donor service, immediately after your death?” This question does not capture as strongly the intent of donation as the American survey does. Therefore, we chose the strongest possible affirmative answer to this question as an indication for willingness to donate. More specifically, possible answers are: Yes, definitely; yes, probably; no, probably not; no definitely know; don’t know. If the respondent chose the alternative “Yes, definitely,” we coded him/her as a potential organ donor.

The descriptive statistics of the European Union data are displayed in Tables 2A and 2B. Table 2A presents the descriptive statistics for the whole sample (individuals who are 18 years of age and older), as well as donors and non-donors for the sample. Table 2B displays the same information for the age group of 18-28. This is the same age span of the individuals in the U.S sample. The rate of willingness to donate an organ in Europe is 41.5 percent in the overall sample, and 44 percent in the sample of young adults (18-to-28 year olds). Population weighted means are 40 percent for the overall adult population, and 42 percent among the 18-to-28 year olds in Europe. Although the

rate of willingness to donate rate is about 22 percent higher among European young adults in comparison to their counterparts in the U.S., some of this difference may be due to the differences in the way the question was asked in the two samples.

In the European sample, the individuals were asked the age at which they stopped their education. The years of education is calculated as the age of the individual minus the age at which they stopped their education minus 6. This variable, therefore, contains some noise, especially for older individuals, who may have enrolled or re-enrolled at school at later years in life. The survey includes the following question to gauge the political inclination of people. “In political matters people talk of “the left” and “the right. How would you place your views on [the scale of 1 (left-most) to 10 (right-most)]?” We coded individuals as liberal if their range is between 1 and 5. About 64 percent of our European Union sample is liberal according to this measure. *Rural* and *Large Town* are binary indicators for whether the person lives in a rural area or a large town, respectively (the left-out category is small or middle sized town). The survey also includes the following question: “The donation and transplantation of human organs is subject to (nationality) legislation. Do you know the rules and regulations in (the country) which govern the donation and transplantation of human organs?” *Organ Donation Knowledge* is a binary variable that equals to 1 if the individual answered in the affirmative to this question.

III. Results

We estimate probit models for the propensity to become an organ donor for both of our U.S. and European samples. The results reported in the paper refer to the marginal

effects and the actual coefficients are available from the authors. Robust standard errors are reported in parentheses.

Results from the U.S .

The results of the analysis of the U.S sample are presented in Table 3. Males are about 9 percentage point less likely to become a registered organ donor in comparison to females. The race of the individual is controlled by three categories: white, black and other (the left-out category). Whites are about 14 percentage points more likely to donate in comparison to the other race category, and Blacks are seven percentage points less likely to do so. The reluctance to donate organs is a well-known characteristic of Blacks in the U.S. (Rozon-Solomon and Burrows, 1999, Spigner et al., 2002). A number of explanations are provided for this outcome. For example, it has been stated that African-Americans are less willing to trust the medical system which has mistreated and badly-served them (Siminoff and Arnold, *Annl internal Med*, 1999).⁶ Other potential factors include concerns about respectful treatment of the body, fear of declaration of death prematurely (McNamara et al., 1999; Callender and Miles 2001). Similarly, Hispanics are about 11 percentage points less likely to become an organ donor than others. It has been shown that Hispanics are less knowledgeable about the facts of organ donation. Interviews conducted with individuals of Hispanic ethnicity suggest that fears of organ being removed before death, doctors taking action to hasten a patient's death, concern for the condition for the body after death, and suspicion about the fairness of the organ distribution system are the major reasons for low donation rate among this group (Verble and Worth 1996, 1998, Roark 1999). Although we cannot address the reasons for low-

⁶ President George W. Bush acknowledged this issue in his speech on January 11, 2005 in Washington DC, where he stated that "African American males die sooner than other males do, which means the system is inherently unfair to certain group of people."

donation rate among Hispanics and African-Americans, the findings point to a need for more effective educational and public awareness programs targeted for these groups. The issue is likely to be increasingly significant as the Hispanic population is projected to more than double between 2000 and 2030 (from 35 million [12.6 % of the population] to 73 million [20% of the population]) (U.S. Bureau of the Census 2005).

Individuals who are born in the U.S. are 7 percentage points more likely to donate in comparison to those who are born elsewhere and migrated to the U.S. Marital status has no impact on the propensity to be a registered organ donor. Religious affiliation is controlled for by four categories: whether the person is Catholic, Protestant, not religious, or whether the person belongs to another religion such as Judaism, Muslim, or Buddhism (the omitted category). Catholics are four percentage points less likely to donate in comparison to individuals who are Jewish, Muslim, Buddhist or adherents of some other religion. This is likely due the fact that there is some disagreement and confusion over the issue of organ donation among Catholics, despite numerous statements made by Catholic scholars and priests indicating that organ donation is permitted and even encouraged by the Catholic Church.⁷

Individuals who classify themselves as liberal are 8 percentage points more likely to be an organ donor in comparison to those are on the right of the political spectrum. As the income of the individual goes up, so does the propensity to donate an organ.

Mother's education has a significant impact as well. If the mother has a high school

⁷ As cited by Byrne (1999), Pope John Paul II in his address on June 20, 1991 to the participants of the first international congress on the transplant of organs stated that "...Furthermore, a person can only donate that of which he can deprive himself without serious danger or harm to his own life or personal identity, and for a just and proportionate reason. It is obvious that vital organs can only be donated after death." Elsewhere, also stated that "Nor can we remain silent in the face of other more furtive, but no less serious and real forms of euthanasia. These could occur for example when, in order to increase the availability of organs for transplants, organs are removed without respecting objective and adequate criteria which verify the death of the honor."

education, her child is about 7 percentage points more likely to donate an organ in comparison to a child with a mother who has no high school diploma. Having a mother who has more than high school education increases the child's likelihood of donation by 12 percentage points. These findings point to the importance of general education on increasing the propensity to become a donor.

Individuals' school and labor market activities are captured by four mutually exclusive dummy variables: Just School, Just Work, Work and School, No Work No School. People who do not work or go to school are 5 percentage points less likely to donate in comparison to those who just work and do not attend school. Those who attend school but do not work (Just School=1) are about 4 percentage points more likely to donate and those who work and go to school at the same time are nearly 3 percentage points more likely to donate in comparison to those who work but do not go to school.

If the individual had an accident he/she is about 2 percentage points more likely to be an organ donor in comparison to those who did not experience an accident. Having an emergency room visit during the last five years increases the propensity to donate by about 3 percentage points. These findings may be due to a higher consciousness or exposure to the significance of organ donation among these individuals.

If the young adult was required to do volunteer work when younger, this increases the propensity to donate by 4 percentage points. Volunteer work itself is a donation activity after all and this result reflects the role of developing a higher sense of social consciousness at early ages in life. However, we refrain from suggesting a causal link

between volunteer work and organ donation because the observed effect may also be due to some unobserved factor.⁸

Results from the European Union

Table 4 displays the results from the European Union. The first two columns report the results for those who are 18 years of age or older and the third and fourth columns pertain to the sample of 18-to-28 year olds. This is the age group of the U.S. sample. We estimated the model with and without country fixed effects. Adding the country-level dummies will control for any unobserved country level unobserved factor (such as cultural and religious pressures) that may affect the donation propensity. The omission of the country dummies will not cause any bias as long as these unobserved factors are uncorrelated with the control variables. As illustrated in Table 4, the results are very similar when we estimated the model without country fixed effects.

The results are interestingly similar between the United States and Europe. For example, parallel to the results from the United States, in Europe individuals who consider themselves on the left side of the political spectrum (*Liberal*) are more likely to be prepared to donate their organs. Males are less likely to be organ donors, and an additional year of education increases the willingness to donate by 0.4 percentage points in the whole sample. As is the case in the U.S. data, marital status has no effect on the willingness to donate. Individuals who have a long-standing medical condition are 5-to-8

⁸ For example, some unobserved family attribute, such as parents' altruism, might have forced the child to do volunteer work when young. Also, parents' altruism might have been transferred to the child in the household. In this scenario, it is the behavior and example of the parents that motivate the individual to donate, and not his past forced-volunteering experience. However, in the data required-volunteer activity does not emerge only because of parents. It could be due to school or a religious group as well, diminishing the potential impact of unobserved family attribute.

percentage points more likely do be organ donors. If the individual is aware of the rules and regulations about organ donation in his or her country, the propensity for organ donation is 18 to 21 percentage points higher, which is very substantial.

There is considerable variation across countries in their residents' propensity to donate an organ. In Table 4 the left-out country is France. Thus, Table 4 indicates that controlling for individual characteristics, among those who are 18 years of age and older, Germans are 17 percentage points less likely to donate an organ than French. On the other hand, Danish, Italians, Spaniards, Portuguese, and people from Luxembourg, Great Britain, Ireland, Finland and Sweden are more likely to donate. Among young adults, nationality (which captures observed cultural differences) has a smaller impact on the propensity to donate. Specifically, among the 18-28 year olds, Danish, Finnish and Spaniards have higher donation propensity, and Germans have lower willingness to donate in comparison to French. Young adults in other countries do not have significantly different donation propensities in comparison to French young adults.

IV. Summary and Conclusions

The total value of life lost due to death because of waiting for an organ transplant is greater than \$4 billion annually in the United States. Despite the fact that laws in almost every state in the United States indicate that information revealed on donor cards and driver's licenses are legally binding, physicians and organ procurement organizations still seek the consent of the deceased person's family. As a result, efforts have focused on the investigation of factors that determine a family's consent for procurement.

Policies targeted to increase willingness to donate are also useful avenues to increase the supply. This is because, in the U.S. about one-third of organ procurement organizations follow the deceased's wishes regardless of the family's preferences. Furthermore, it is also documented that families are much more likely to consent to organ donation if they knew that the deceased had a donor card.

This suggests, for example, that a 5 percentage point increase in the willingness of organ donation (as revealed by a donor card) would translate into a 3-to-4 percent increase in actual organ donations as detailed in the introduction.

To shed light on the factors that impact the willingness to be a potential organ donor, we analyze data from the United States and the European Union. A number of patterns emerge, which are interestingly consistent between Europeans and Americans. The determinants of organ donation propensity identified in this paper can be classified in three groups. In the first group are factors that cannot be influenced by policy makers. Examples are gender (males have a lower propensity to donate organs), race in the United States (whites having a higher propensity and Blacks and Hispanics having a lower propensity in comparison to other races and non-Hispanics), political affiliation (individuals with liberal tendencies have higher propensities to donate), and religion (Catholics are less likely to donate). Even though the government cannot take action to change any of the group characteristics of these individuals, allocation of resources towards or more effective campaigns targeted at certain groups may have the intended impact of increasing the organ donation rate. It may be difficult to convince a person who is fully knowledgeable and yet unwilling to donate his/her organs. On the other hand, gains can be achieved among groups like Blacks, Hispanics, and Catholics who do

not donate because of lack of knowledge or inaccurate perceptions and concern. Public education and training campaigns targeted at these groups may have the potential to narrow the organ shortage.

In the second category are factors that lend themselves to quick policy actions. For example, individuals who reveal that they are familiar with the rules and regulations governing the donation and transplantation of human organs are more likely to donate. This suggests that campaigns to educate the public along this dimension are likely to have a positive impact on the rate of donations. It is found that individuals who had some encounter with the health care sector –either through an emergency room visit during the last five years (in the U.S.), or perhaps because of a long-standing illness (in the E.U), are more likely to become organ donors. This also provides a useful avenue through which limited resources can be spent to alleviate the rate of donations.

An interesting result obtained in the U.S. pertains to learned altruism. Individuals who were required to do volunteer work or community service when they were younger have higher donation propensities. This may suggest that altruism is a characteristic that can be fostered in young children by programs that promote altruistic behavior. It can also be the case that unobserved characteristics of the family where the individual grew up in may be responsible for this outcome.

The third category contains factors that are important, but would affect the donation behavior in the long-run. For example, education of the individual has a positive effect on the willingness to donate both in Europe and the U.S. Furthermore, holding constant the individual's education, mother's education has an additional positive impact.

Table 1
Descriptive Statistics – United States

Variable Name	Definition	Overall Mean (Std. Dev.) (I)	Donors Mean (Std. Dev.) (II)	Non-Donors Mean (Std. Dev.) (III)
Organ Donor	Dummy variable equal to 1 if the individual is a registered organ donor, 0 otherwise	0.358 (0.479)	-----	-----
Age	Individual's age	21.958 (1.771)	21.937 (1.734)	21.969 (1.792)
Male	Dummy variable equal to 1 if male, 0 otherwise	0.470 (0.499)	0.412*** (0.492)	0.502*** (0.500)
White	Dummy variable equal to 1 if white, 0 otherwise	0.664 (0.473)	0.774*** (0.418)	0.602*** (0.490)
Black	Dummy variable equal to 1 if black, 0 otherwise	0.213 (0.409)	0.144*** (0.351)	0.251*** (0.434)
Hispanic	Dummy variable equal to 1 if Hispanic, 0 otherwise	0.160 (0.367)	0.104*** (0.305)	0.191*** (0.393)
U.S.-born	Dummy variable equal to 1 if the individual was born in the U.S., 0 otherwise	0.920 (0.271)	0.951*** (0.217)	0.903*** (0.295)
Married	Dummy variable equal to 1 if married, 0 otherwise	0.173 (0.378)	0.172 (0.378)	0.173 (0.378)
Catholic	Dummy variable equal to 1 if catholic, 0 otherwise	0.252 (0.434)	0.229*** (0.420)	0.266*** (0.442)
Protestant	Dummy variable equal to 1 if protestant, 0 otherwise	0.403 (0.491)	0.407 (0.491)	0.401 (0.490)
No religion	Dummy variable equal to 1 if no religion, 0 otherwise	0.201 (0.401)	0.214*** (0.410)	0.194*** (0.395)
Required volunteering	Dummy variable equal to 1 if the individual was required to do volunteer work when young, 0 otherwise	0.094 (0.291)	0.107*** (0.309)	0.087*** (0.281)
Income	Total income of the individual	14024.1 (15603.8)	14455.1** (14619.5)	13783.9** (16122.3)

(Table 1 concluded)

Mother-High School	Dummy variable equal to 1 if mother has high school education; 0 otherwise	0.319 (0.466)	0.311 (0.463)	0.323 (0.468)
Mother-More than High School	Dummy variable equal to 1 if the individual's mother has more than high school Education; 0 otherwise	0.437 (0.496)	0.514*** (0.500)	0.393*** (0.489)
Accident	Dummy variable equal to 1 if injured by an accident during past 12 months; 0 otherwise	0.149 (0.356)	0.153 (0.360)	0.146 (0.353)
Emergency Room	Dummy variable equal to 1 if the individual has been seen in an emergency room during past 5 years; 0 otherwise	0.587 (0.492)	0.609*** (0.488)	0.575*** (0.494)
Hospitalization	Dummy variable equal to 1 if the individual has been admitted to a hospital during past 5 years; 0 otherwise	0.268 (0.443)	0.264 (0.441)	0.270 (0.444)
Middle-of-the-road	A dummy variable equal to 1 if the individual considers him/herself politically on the middle of the spectrum, 0 otherwise.	0.526 (0.499)	0.510*** (0.500)	0.535*** (0.499)
Liberal	A dummy variable equal to 1 if the individual considers him/herself politically on the left of the spectrum, 0 otherwise.	0.184 (0.387)	0.230*** (0.421)	0.158*** (0.365)
No School, No Work	Dummy variable=1 if the individual is neither attending school nor working; 0 otherwise	0.162 (0.369)	0.122*** (0.328)	0.184*** (0.388)
Only School	Dummy variable=1 if the individual is attending school only; 0 otherwise	0.136 (0.343)	0.154*** (0.361)	0.126*** (0.332)
School & Work	Dummy variable=1 if the individual is both attending school and working; 0 otherwise	0.242 (0.429)	0.270*** (0.444)	0.227*** (0.419)
Number of Observations		13653	4887	8767

A *, **, or *** signifies that the difference in the means between donors and non-donors is statistically different from zero at 10%, 5%, and 1%, respectively, for the corresponding variable.

Table 2A
Descriptive Statistics -- European Union, Age≥18

Variable Name	Variable Description	Overall Mean (Std. Dev.)	Donors Mean (Std. Dev.)	Non-Donors Mean (Std. Dev.)
Organ donor	A dummy variable equal to 1 if the individual will definitely donate his/her organ after death, 0 otherwise.	0.414 (0.493)	-----	-----
Age	Individual's age	46.305 (17.069)	44.819*** (16.233)	47.359*** (17.563)
Education	The number of years of education	13.066 (6.559)	13.757*** (6.714)	12.576*** (6.402)
Student	A dummy variable equal to 1 if the individual is currently in school, 0 otherwise.	0.070 (0.256)	0.078** (0.268)	0.065** (0.247)
Liberal	A dummy variable equal to 1 if the individual considers him/herself politically on the left of the spectrum, 0 otherwise.	0.617 (0.486)	0.645 (0.479)	0.597 (0.490)
Married	A dummy variable equal to 1 if the individual is married, 0 otherwise.	0.531 (0.499)	0.537 (0.499)	0.527 (0.499)
Divorced	A dummy variable equal to 1 if the individual is divorced, 0 otherwise.	0.066 (0.249)	0.066 (0.249)	0.066 (0.249)
Male	A dummy variable equal to 1 if the individual is a male, 0 otherwise.	0.487 (0.500)	0.459*** (0.498)	0.507*** (0.500)
Rural	A dummy variable equal to 1 if the individual lives in rural area, 0 otherwise.	0.351 (0.477)	0.336*** (0.472)	0.362*** (0.481)
Large town	A dummy variable equal to 1 if the individual lives in a large town, 0 otherwise.	0.326 (0.469)	0.321 (0.467)	0.329 (0.470)
Health problem	A dummy variable equal to 1 if the individual has a long-standing health problem, 0 otherwise.	0.287 (0.452)	0.306*** (0.461)	0.274*** (0.446)
Organ Donation Knowledge	A dummy variable equal to 1 if the individual knows the rules or regulation about organ donation in his/her country, 0 otherwise.	0.367 (0.482)	0.483*** (0.500)	0.285*** (0.451)

(Table 2A continued)

Belgium	A dummy variable equal to 1 if the individual is a citizen of Belgium, 0 otherwise.	0.063 (0.244)	0.063 (0.242)	0.064 (0.245)
Denmark	A dummy variable equal to 1 if the individual is a citizen of Denmark, 0 otherwise.	0.077 (0.267)	0.099*** (0.298)	0.062*** (0.242)
Greece	A dummy variable equal to 1 if the individual is a citizen of Greece, 0 otherwise.	0.057 (0.231)	0.051** (0.220)	0.061** (0.239)
Italy	A dummy variable equal to 1 if the individual is a citizen of Italy, 0 otherwise.	0.055 (0.229)	0.067*** (0.250)	0.047*** (0.212)
Spain	A dummy variable equal to 1 if the individual is a citizen of Spain, 0 otherwise.	0.051 (0.220)	0.054 (0.227)	0.049 (0.215)
France	A dummy variable equal to 1 if the individual is a citizen of France, 0 otherwise.	0.062 (0.241)	0.054*** (0.226)	0.067*** (0.250)
Luxembourg	A dummy variable equal to 1 if the individual is a citizen of Luxembourg, 0 otherwise	0.039 (0.193)	0.043* (0.202)	0.036* (0.186)
Netherlands	A dummy variable equal to 1 if the individual is a citizen of The Netherlands, 0 otherwise.	0.081 (0.273)	0.079 (0.270)	0.082 (0.274)
Portugal	A dummy variable equal to 1 if the individual is a citizen of Portugal, 0 otherwise.	0.052 (0.223)	0.055 (0.228)	0.050 (0.219)
Great Britain	A dummy variable equal to 1 if the individual is a citizen of Great Britain, 0 otherwise.	0.056 (0.229)	0.071*** (0.257)	0.045*** (0.207)
Finland	A dummy variable equal to 1 if the individual is a citizen of Finland, 0 otherwise	0.071 (0.257)	0.072 (0.258)	0.071 (0.257)
Sweden	A dummy variable equal to 1 if the individual is a citizen of Sweden, 0 otherwise	0.081 (0.274)	0.105*** (0.307)	0.065*** (0.246)
Austria	A dummy variable equal to 1 if the individual is a citizen of Austria, 0 otherwise	0.053 (0.224)	0.043*** (0.203)	0.060*** (0.237)
Germany	A dummy variable equal to 1 if the individual is a citizen of Germany, 0 otherwise.	0.126 (0.331)	0.068*** (0.252)	0.166*** (0.372)

(Table 2A concluded)

Ireland	A dummy variable equal to 1 if the individual is a citizen of Ireland, 0 otherwise.	0.076 (0.265)	0.077 (0.267)	0.075 (0.264)
Number of observations		9,785	4,058	5,727

A *, **, or *** signifies that the difference in the means between donors and non-donors is statistically different from zero at 10%, 5%, and 1%, respectively, for the corresponding variable.

Table 2B
Descriptive Statistics -- European Union, Age: 18-28

Variable Name	Variable Description	Overall Mean (Std. Dev.)	Donors Mean (Std. Dev.)	Non-Donors Mean (Std. Dev.)
Organ donor	A dummy variable equal to 1 if the individual will definitely donate his/her organ after the death, 0 otherwise.	0.441 (0.497)	-----	-----
Age	Individual's age	23.320 (3.072)	23.494** (3.102)	23.182** (3.042)
Education	The number of years of education	13.901 (3.090)	14.141*** (3.108)	13.712*** (3.064)
Student	A dummy variable equal to 1 if the individual is currently in school, 0 otherwise.	0.348 (0.477)	0.353 (0.478)	0.345 (0.476)
Liberal	A dummy variable equal to 1 if the individual considers him/herself politically on the left side, 0 otherwise.	0.646 (0.478)	0.683*** (0.466)	0.617*** (0.486)
Married	A dummy variable equal to 1 if the individual is married, 0 otherwise.	0.131 (0.337)	0.134 (0.340)	0.128 (0.335)
Divorced	A dummy variable equal to 1 if the individual is divorced, 0 otherwise.	0.006 (0.079)	0.006 (0.080)	0.006 (0.078)
Male	A dummy variable equal to 1 if the individual is a male, 0 otherwise.	0.494 (0.500)	0.456*** (0.498)	0.524*** (0.500)
Rural	A dummy variable equal to 1 if the individual lives in rural area, 0 otherwise.	0.307 (0.461)	0.298 (0.458)	0.314 (0.465)
Large town	A dummy variable equal to 1 if the individual lives in a large town, 0 otherwise.	0.373 (0.484)	0.362 (0.481)	0.382 (0.486)
Health problem	A dummy variable equal to 1 if the individual has a long-standing health problem, 0 otherwise.	0.141 (0.349)	0.172*** (0.378)	0.117*** (0.322)
Organ Donation Knowledge	A dummy variable equal to 1 if the individual knows the rules or regulation about organ donation in his/her country, 0 otherwise.	0.299 (0.458)	0.376*** (0.485)	0.239*** (0.426)

(Table 2B continued)

Belgium	A dummy variable equal to 1 if the individual is a citizen of Belgium, 0 otherwise.	0.056 (0.230)	0.044** (0.204)	0.066** (0.248)
Denmark	A dummy variable equal to 1 if the individual is a citizen of Denmark, 0 otherwise.	0.070 (0.254)	0.096*** (0.295)	0.049*** (0.215)
Greece	A dummy variable equal to 1 if the individual is a citizen of Greece, 0 otherwise.	0.066 (0.248)	0.056 (0.231)	0.073 (0.260)
Italy	A dummy variable equal to 1 if the individual is a citizen of Italy, 0 otherwise.	0.060 (0.237)	0.069 (0.254)	0.053 (0.223)
Spain	A dummy variable equal to 1 if the individual is a citizen of Spain, 0 otherwise.	0.080 (0.271)	0.100*** (0.300)	0.064*** (0.244)
France	A dummy variable equal to 1 if the individual is a citizen of France, 0 otherwise.	0.059 (0.236)	0.054 (0.226)	0.064 (0.244)
Luxembourg	A dummy variable equal to 1 if the individual is a citizen of Luxembourg, 0 otherwise	0.039 (0.194)	0.044 (0.204)	0.035 (0.185)
Netherlands	A dummy variable equal to 1 if the individual is a citizen of The Netherlands, 0 otherwise.	0.077 (0.267)	0.062** (0.241)	0.089** (0.285)
Portugal	A dummy variable equal to 1 if the individual is a citizen of Portugal, 0 otherwise.	0.055 (0.228)	0.063 (0.243)	0.049 (0.215)
Great Britain	A dummy variable equal to 1 if the individual is a citizen of Great Britain, 0 otherwise.	0.059 (0.235)	0.063 (0.243)	0.056 (0.229)
Finland	A dummy variable equal to 1 if the individual is a citizen of Finland, 0 otherwise	0.078 (0.268)	0.094** (0.292)	0.066** (0.248)
Sweden	A dummy variable equal to 1 if the individual is a citizen of Sweden, 0 otherwise	0.072 (0.258)	0.078 (0.269)	0.067 (0.250)
Austria	A dummy variable equal to 1 if the individual is a citizen of Austria, 0 otherwise	0.050 (0.219)	0.036*** (0.186)	0.062*** (0.241)
Germany	A dummy variable equal to 1 if the individual is a citizen of Germany, 0 otherwise.	0.085 (0.280)	0.050*** (0.218)	0.113*** (0.317)

(Table 2B concluded)

Ireland	A dummy variable equal to 1 if the individual is a citizen of Ireland, 0 otherwise.	0.094 (0.293)	0.091 (0.288)	0.097 (0.296)
Number of observations		1,768	779	989

A *, **, or *** signifies that the difference in the means between donors and non-donors is statistically different from zero at 10%, 5%, and 1%, respectively, for the corresponding variable.

Table 3
Probit Regression for Organ Donation
(U.S. Data)

Variable	Coefficient	Standard Error
Age	0.120**	0.054
Age Squared	-0.003**	0.001
Male	-0.099***	0.009
White	0.135***	0.015
Black	-0.068***	0.017
Hispanic	-0.111***	0.012
US-born	0.072***	0.017
Married	-0.006	0.012
Catholic	-0.041***	0.014
Protestant	-0.011	0.013
No religion	-0.007	0.015
Required volunteering	0.042***	0.015
Healthy	0.027	0.020
Income (\$millions)	0.777***	0.278
Mother-high school	0.082***	0.015
Mother more than high school	0.137***	0.014
Accident	0.024**	0.012
Emergency room	0.034***	0.009
Hospitalization	-0.004	0.010
Middle-of-the-road	-0.001	0.011
Liberal	0.079***	0.014
No work no school	-0.053***	0.012
Just school	0.038***	0.014
Work and school	0.029***	0.011
Number of Observations	13,653	
Log-likelihood	-8314.51	

The dependent variable is dichotomous, which takes the value of one if the respondent is a registered organ donor, and zero otherwise. The coefficients are marginal effects. Robust standard errors are in column II. *, **, *** signify statistical significance at 10%, 5%, and 1% confidence level, respectively.

Table 4
Probit Regressions for Organ Donation
(European Union Data)

Variables	Age≥18		Age 18-28	
	(I)	(II)	(III)	(IV)
Liberal	0.046*** (0.010)	0.046*** (0.011)	0.076*** (0.025)	0.082*** (0.026)
Married	0.018 (0.012)	0.020 (0.012)	0.0004 (0.039)	-0.009 (0.039)
Divorced	-0.006 (0.022)	0.011 (0.023)	-0.068 (0.139)	-0.052 (0.147)
Male	-0.035*** (0.010)	-0.033*** (0.010)	-0.049** (0.024)	-0.050** (0.025)
Education	0.005*** (0.001)	0.004*** (0.001)	0.010* (0.005)	0.007 (0.005)
Rural	-0.025** (0.012)	-0.014 (0.013)	-0.035 (0.031)	-0.014 (0.034)
Student	0.017 (0.024)	0.010 (0.024)	0.003 (0.035)	-0.001 (0.035)
Large town	-0.032** (0.012)	0.013 (0.013)	-0.048* (0.029)	-0.015 (0.031)
Age	0.003* (0.002)	0.004* (0.002)	-0.119* (0.067)	-0.133** (0.068)
Age-squared	-0.00006*** (0.00002)	0.00007*** (0.00002)	0.003* (0.001)	0.003** (0.001)
Health problem	0.061*** (0.012)	0.050*** (0.012)	0.099*** (0.034)	0.085** (0.035)
Knowledge	0.199*** (0.01)	0.215*** (0.011)	0.157*** (0.026)	0.176*** (0.027)
Belgium		0.027 (0.029)		-0.070 (0.069)
Denmark		0.129*** (0.029)		0.188*** (0.067)
Greece		0.023 (0.030)		-0.006 (0.068)
Italy		0.061** (0.031)		0.034 (0.071)
Spain		0.090*** (0.031)		0.160** (0.065)
Luxembourg		0.120*** (0.034)		0.082 (0.080)
Netherlands		-0.020 (0.027)		-0.077 (0.064)

(Table 4 concluded)

Portugal		0.086*** (0.032)		0.115 (0.073)
Great Britain		0.165*** (0.030)		0.049 (0.072)
Finland		0.052* (0.029)		0.130* (0.068)
Sweden		0.165*** (0.028)		0.069 (0.068)
Austria		-0.023 (0.030)		-0.113 (0.069)
Germany		-0.167*** (0.022)		-0.169*** (0.057)
Ireland		0.093*** (0.028)		0.039 (0.064)
Number of Observation	9,785	9,785	1,768	1,768
Log-likelihood	-6,344.2	-6,175.4	-1,174.7	-1,139.6

The dependent variable is dichotomous, which takes the value of one if the respondent strongly reveals his/her willingness to donate an organ, and zero otherwise. The coefficients are marginal effects. Robust standard errors are in parentheses. *, **, *** signify statistical significance at 10%, 5%, and 1% confidence level, respectively.

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