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## Motivation and Social Capital among prospective blood donors in three large blood centers in Brazil

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### Abstract

**Background**—Studies analyzing motivation factors that lead to blood donation have found altruism to be the primary motivation factor; however social capital has not been analyzed in this context. Our study examines the association between motivation factors (altruism, self-interest and response to direct appeal) and social capital (cognitive and structural) across three large blood centers in Brazil.

**Study Design and Methods**—We conducted a cross-sectional survey of 7,635 donor candidates from October 15 through November 20, 2009. Participants completed self-administered questionnaires on demographics, previous blood donation, HIV testing and knowledge, social capital and donor motivations. Enrollment was determined prior to the donor screening process.

**Results**—Among participants, 43.5% and 41.7% expressed high levels of altruism and response to direct appeal respectively, while only 26.9% expressed high levels of self-interest. More high self-interest was observed at Hemope-Recife (41.7%). Of participants, 37.4% expressed high levels of cognitive social capital while 19.2% expressed high levels of structural social capital. More high cognitive and structural social capital was observed at Hemope-Recife (47.3% and 21.3%, respectively). High cognitive social capital was associated with high levels of altruism, self-interest and response to direct appeal. Philanthropic and high social altruism was associated with high levels of altruism and response to direct appeal.

**Conclusion**—Cognitive and structural social capital and social altruism are associated with altruism and response to direct appeal, while only cognitive social capital is associated with self-interest. Designing marketing campaigns with these aspects in mind may help blood banks attract potential blood donors more efficiently.

## Keywords

blood donation; Brazil; social capital; motivation

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## Introduction

The worldwide ongoing need for blood donation to support the recent blood transfusion demand due to population growth, life expectancy, advanced diagnoses and treatment methods for trauma patients, hematology, oncology, surgeries, liver and lung transplants, poses a continuous challenge to the blood banks in providing a regular, sufficient and safe source of blood donors. The World Health Organization (WHO) postulates that 1% to 3% of the population should donate blood regularly to maintain the levels of sufficient blood supply. Half of the global blood donations are collected in developed nations, home to only 16 percent of the world's population<sup>1, 2</sup>.

Previous studies have analyzed different aspects that might lead individuals to blood donation. Using various approaches authors have studied motivation factors such as altruistic behavior, pro-social norms, benevolence, and the Theory of Planned Behavior, yet there is evidence that blood donation rates vary by gender, age, socioeconomic status, ethnicity, education and religion<sup>3-17</sup>. These studies have led to substantial insights explaining blood donors' motivations worldwide. However, this has not helped to explain why, despite continuous population growth, the donation rates have stabilized or are decreasing in many countries in Europe, Latin America and in the US<sup>14, 18-22</sup>. Additionally, blood centers are often facing temporary and frequent blood shortages resulting in elective surgery cancellations<sup>10,13,14,23-27</sup>. Even after a disaster when blood donation greatly increases, the increase does not last for a long time<sup>10,28</sup>. Nonetheless, marketing campaigns are able to increase the blood donation rates for a short term period<sup>10,28-31</sup>.

In the US for instance, only 8% of first-time donors return to donate on a regular basis, and approximately 62% do not return to where they originally donated within 5 to 6 years<sup>32</sup>. Southeast Asia collected only 7 million units of the 15 million units required in 2005<sup>27</sup>. In Latin America, there has been more available blood in recent years; however there is not enough blood for the entire region because only a few countries collect enough to cover their needs<sup>2,20,21,25</sup>. In Brazil, it is estimated that 1.9% of the population donates voluntarily every year, which represents 3.5 million collected units. Although this percentage is within the parameters established by the World Health Organization (WHO), the ideal is to reach 5.7 million collected units annually<sup>33</sup>.

Strong empirical evidence shows that blood donation is a multifactorial process that involves a plethora of variables, which may affect each individual differently in their lifetime. Social capital relates to donor motivation through the concept that blood donation is a social phenomenon that is embedded in the context of community<sup>34-36</sup>. Social capital has been defined as “features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions and cooperation for mutual benefits”<sup>37</sup>. Social capital is also described as structural resources that constitute a capital asset for the individual and also facilitate certain common action that make up this structure<sup>38</sup>. Social capital includes two distinct components: structural and cognitive<sup>38</sup>. Cognitive social capital underlies the visible structure, which derives from mental processes and ideas, reinforced by culture, ideology, norms, values, attitudes and beliefs that contribute to cooperative behavior<sup>39,40</sup>. The cognitive component encompasses perceptions of support, reciprocity, sharing and trust<sup>39,40</sup>. The structural component includes the rules, precedents, procedures, and the wide variety of networks that contribute to cooperation<sup>39,40</sup>.

In summary, social capital is seen as how people embed themselves within the social organization of a community. People embedded in social relationships that they value are motivated to act in ways that support those relationships<sup>37</sup>. In this context, blood donation can be seen as the benchmark of the measurement of levels of social capital<sup>41</sup>. Social capital has been also associated with the willingness of people to give some of their resources to others<sup>42</sup>. In this sense, philanthropy is defined as an altruistic concern for human welfare usually manifested by donations of money, time or work to a person or institution in need. Blood donation can be seen as a health related form of philanthropy<sup>43</sup>. Finally, social capital may promote both the donation of blood and donation of money to charitable causes<sup>36</sup>.

Although altruism is the primary reason for individual's blood donation in Brazil, our hypothesis is that the social context might be a contributor in this process<sup>8,44</sup>. The aims of this study are to describe the motivation factors (altruism, self-interest and response to direct appeal) and the social capital components (cognitive and structural) across three large blood centers and to examine the association between social capital and motivation factors for blood donation in Brazil.

## Material and Methods

We conducted cross-sectional survey of 7,635 blood donation candidates at three public Brazilian blood centers from October 15, 2009 thru November 20, 2009. The three centers in this study included Fundação Pró-Sangue/Hemocentro de São Paulo in São Paulo (FPS- São Paulo), Fundação Hemominas in Belo Horizonte, Minas Gerais (Hemominas) and Fundação Hemope in Recife, Pernambuco (Hemope), participating in the National Heart, Lung and Blood Institute's REDS-II International component. A consecutive sample of donor candidates aged 18 to 65 years that presented to donate blood during the period of study were invited to participate. Signed informed consent was obtained and subjects completed the self-administered paper questionnaire while at the blood center. A participant's enrollment in the study was obtained prior to the donor screening process; both approved and deferred donors were included in the study. Of note, all Brazilian donors are non-remunerated.

All returned questionnaires were scanned into an electronic database using the software TELEFORM® (Cardiff, Vista, California). Questionnaires that were returned but not filled out were excluded from this analysis. Completed questionnaires were shipped weekly to one center for scanning and processing. After all of the data was compiled, the final set of questionnaire data was sent to Westat (REDS-II International Coordinating center) for incorporation into the analytic dataset.

In addition to the questionnaire data, the analysis dataset contained data abstracted from the REDS-II Brazil Donation and Deferral Database, a compilation of selected information on all donations and deferrals captured from standardized donor screening procedures at the three blood centers. This included prospective donor demographics, donor/donation characteristics (community vs. replacement, first-time vs. repeat) and information regarding the deferral reason (if the visit was a deferral).

## Study Measures

The questionnaire contained questions on demographics, previous blood donation, HIV testing and knowledge, social capital, and motivation factors for donation. Attributes of donor motivation measured in the survey included test seeking, altruism, self-interest, and response to direct appeal.

The motivation questions were based on previous study of Glynn and colleagues and Sharma and colleagues<sup>3,45</sup>. Altruism was measured by a group of 4 questions regarding pro-social attitudes: “To anonymously help someone else who needs blood”; “I think that it is important to give blood”; “I think that I am doing something important for society”; and “Blood banks always need blood donors and so donating is the right thing to do”. Measures of self-interest were based on 7 questions related to financial incentive (“Someone offered me money for donating”), perceived health benefits (“I heard that blood donation is good for my health”), time off work (“I wanted to get off the work today”), indirect reciprocity (“I may need blood myself someday”), health check (“I like to know about my health and blood donation is a good way to find out”), self-esteem (“Donating blood makes you feel good about yourself”), and quality of testing (“Testing is more accurate than at other sites”). Response to direct appeal was measured by 4 questions associated with marketing communications such as direct marketing (“I received a telephone call or letter from the blood bank asking me to donate” and “My blood type is in high demand”), advertising (“In response to a campaign on TV or radio”), and personal direct request (“To help a friend or relative who is sick or needs blood”).

Continuous variables were created, and all valid, non-missing values were summed to produce scores. Altruism scores ranged from 0 to 8, self-interest scores ranged from 0 to 14, and response to direct appeal scores ranged from 0 to 8. Levels of motivation factors for altruism, self-interest, and response to direct appeal were created by weighting Likert scale-responses (“Totally agree”= 2; “Agree”= 1; “Disagree”, “Totally disagree” or “Don't Know”=0), summing valid, non-missing values to produce scores, and ranking them Low, Average and High based on roughly lower, middle (inter quartile range) and upper quartiles.

Social capital was measured by a group of 4 structural and 14 cognitive questions according Harpham et al<sup>40</sup>. The structural social capital questions contained content about participation in one or more social groups or organizations, helping other members of the community and their link with his/her neighbors, and giving money or time to organizations or charities as a measure of social involvement. The cognitive social capital questions inquired about whether the respondent received any help (emotional or social support) from his/her neighbors, and about feelings, trust, cooperation and support. Tables A and B in the Appendix show the structural and cognitive questions and their intended meanings. The structural questions were combined into a single structural score. For questions where the possible answers were “Yes”, “No”, or “Don't Know”, the following weights were applied: 2 for “Yes”, and 0 for all other responses. For questions with Likert scale-responses, the weights were 2 for “Totally agree”, 1 for “Agree”, and 0 for “Disagree”, “Totally disagree” and “Don't Know”. Similarly the cognitive questions were combined into a single cognitive score. The derivation of these scores was supported by principal component analysis. In the principal component analysis each structural question had an approximately equal loading factor in the structural component and each cognitive question had an approximately equal loading factor in the cognitive component. Further, the principal component analysis derived statistically indistinguishable weights for responses “No” and “Don't Know” for questions of that type and statistically indistinguishable weights for responses “Totally disagree”, “Disagree” and “Don't Know”. Summary scores were grouped into a 3 level categorization: Low, Average, and High. The categorized summary structural and cognitive variables were used in the analysis.

Social altruism was measured by 4 questions: “Have you helped carry a stranger's belongings?”, “Have you allowed someone to go ahead of you in a line?”, “Have you offered to help a handicap or elderly person across a street?”, and “Do you give money to charity?”. Those answering “Yes” to “Do you give money to charity?” and at least two of the other questions were classified as having Philanthropic plus High social altruism. Those

answering “No” to the question about charity and “Yes” to the other three questions were classified as having High social altruism. Those answering “Yes” to one or two of the four questions were classified as having Average social altruism, and remaining respondents were classified as “No”, “Don't Know” or “Missing”.

### Statistical Analysis

The likelihood ratio chi-square was calculated between each variable of interest and each of the three donor motivations. These variables included categorized cognitive and structural social capital, level of social altruism, gender, age group, education, income, marital status, blood center location, donor presentation type (community vs. replacement vs. deferred) and donation status (first time vs. repeat). These same variables were included as independent variables of interest in the logistic regression models. We used separate multivariable logistic regression models to compare High level versus Average and Low level combined of each donor motivation (altruism, self-interest, response to direct appeal). Cognitive and structural social capital scores were maintained as predictors in the all models, in addition to the other independent variables. SAS/STAT version 9.2 (SAS Institute Inc., Cary, NC) was used for these analyses.

### Results

During the study period, there were a total of 16,275 presentations for whole blood donation at the three centers. Of those, 12,793 (78.6%) and 3,482 (21.4%) were accepted and deferred donors respectively. Of all presentations, 6,745 (41.5%) occurred at Hemope-Recife followed by 5,595 (34.4%) at FPS-São Paulo and 3,935 (24%) at Hemominas-Belo Horizonte. We distributed 9,000 study questionnaires to the three centers, and of those 7,635 (87.8%) were retrieved for the study. Of 7,635 respondents, 2,673 (35.0%) were enrolled at FPS-São Paulo, 2,547 (33.4%) at Hemominas-Belo Horizonte, and 2,415 (31.6%) at Hemope-Recife (Table 1). Overall, 4,924 (64.5%) of the participants were male, 3,681 (48.2%) were community donors, 4,844 (63.4%) were repeat donors, and 1,444 (18.9%) were deferred.

The highest proportion of male donor candidates were observed at Hemope-Recife (76.4%), followed by 59.6% in FPS-São Paulo and 58.3% at Hemominas-Belo Horizonte. For both male and female presentations, 73.2% were 18 to 39 years old, 71% had attained at least high school or college education levels, 37.9% were single and 49.4% were married or were living together.

Overall, 37.4% of the participants expressed high level of cognitive social capital compared to 19.2% who expressed high level of structural social capital. Higher percentages of high cognitive and structural social capital were observed at Hemope-Recife (47.3% and 21.3%) followed by Hemominas-Belo Horizonte (37.6% and 20.6%) and FPS-São Paulo (28.4% and 15.9%). The main motivation factor among Brazilian blood donors was altruism, followed by response to direct appeal and self-interest. Among participants, 43.5% and 41.7% expressed high levels of altruism and response to direct appeal respectively, while only 26.9% expressed high levels of self-interest (Table 2). High self-interest was two-fold more likely to be observed at Hemope-Recife (41.7%) compared to Hemominas-Belo Horizonte and FPS-São Paulo (19.6% and 20.4%), respectively.

In multivariable analysis (Table 3), respondents with higher education and income levels, community and repeat prospective donors were associated with high altruism. High levels of altruism were also associated with both average and high cognitive and structural social capital. Those with high social altruism and philanthropic plus high social altruism were also more likely to have high altruism. However respondents aged 31 or older, as well as males,

were less likely to have high levels of altruism. Blood center location was not a predictor of high altruism level.

Respondents, who were male, aged 26 to 30 years old, having lower education and income levels, and presenting as replacement donors were more likely to have high levels of self-interest. Self-interest was associated with average and high cognitive social capital but no association was observed with any level of structural social capital or social altruism. First time presenting donors were less likely to have high self-interest, as were those with high income levels. Participants from Hemope-Recife were more likely to have high levels of self-interest and participants from Belo Horizonte were less likely.

High level of response to direct appeal was independently associated with respondents aged 31 or older, and repeat donors. Gender, marital status, education, donor presentation type and structural social capital were not associated with high level of response to direct appeal. Respondents with average and high cognitive social capital, as well as with high and philanthropic plus high social altruism were more likely to be associated with high response to direct appeal, as were those from Hemominas-Belo Horizonte.

## Discussion

To our knowledge this is the first study that analyzed motivation for blood donation and social capital in Brazil. Moreover, there is no published study analyzing philanthropy and social altruism among prospective donors in Brazil. As has been found in previous studies, altruism is the main motivator for blood donation in Brazil. However, response to direct appeal and self-interest motivation factors can play greater or lesser roles depending on demographics and geographic location<sup>3,8,11,14,18,44, 46, 47</sup>. In this study, cognitive social capital is the main component of the social capital domain and levels of social capital varied across the three blood centers.

The most striking finding in our study is the overall low levels of high structural social capital observed across the three blood centers. Social capital has been described as a multidimensional domain that encompasses three crucial elements: pro-social norms, social networks and trust<sup>37</sup>. Those elements are related to structural (quantity of social relationship, the individuals participation in institutions, community associations and connectedness) and cognitive (quality of relationship: social support, trust and cooperation towards the community) components<sup>48</sup>. In this sense, the overall low levels of structural social capital reveals less connectedness, less participation in organizations and less association among the participants. Two possible explanations may be correlated to this finding. First, previous studies demonstrated that a lack of social connectedness is associated with poverty, discrimination and violence, which are ingredients of daily life in the metropolitan cities of Brazil<sup>49-51</sup>. Second, the lower participation of these individuals in organization/institutions might be also revealing a lack of trust in the organizations/institutions. The latter hypothesis is corroborated by the overall low levels of philanthropy found in our study. According to many authors philanthropy implies trust, and trust is often regarded as an ingredient of social capital, next to social network and civic engagement<sup>36, 52</sup>. Moreover, philanthropic organizations strongly depend on the public's trust<sup>36,53,54</sup>. In addition, the participants demonstrated low levels of high structural social capital and philanthropic plus high social altruism, but were more prone to have high socially altruistic attitudes, such as carrying someone belongings, rather than philanthropic ones. Interestingly, lower levels of high structural social capital and philanthropic plus high social altruism were observed in Sao Paulo, one of the most developed states of Brazil.



Usually low levels of social capital are linked with individual experiences of alienation and social disconnection associated with a growing sensitivity to diversity and also to low formal educational levels<sup>54,55</sup>. A possible explanation for this finding might be related to the highly populated Sao Paulo metropolitan area, associated with extensive commute and transportation problems, levels of urban violence, social and economic disparities<sup>50,51</sup>. Those factors may be leading individuals to act introspectively and to have fewer bonds to institutions and organizations<sup>54</sup>. Conversely, the higher levels of high cognitive and structural social capital observed in Recife suggest that participants are protecting and supporting themselves and their community against deficiencies related to their lower economic status<sup>40,56</sup>. The two above hypotheses may also explain the low percentage rate of high cognitive social capital observed at FPS-São Paulo (28.4%) compared to 37.6% in Belo Horizonte and 47.3% in Recife. In addition, a recent study has investigated the social representation of Sao Paulo population comparing the positive and negative attributes on a scale of one to seven. The six attributes that São Paulo population described themselves with higher scores in descending order were: dynamic and individualistic (same score), progressive, selfish, sexist, and disciplined<sup>57</sup>. Altruism was associated with average and high levels of cognitive social capital, however it is interesting to point out that structural social capital was uniquely associated with altruism. Our finding demonstrates that connectedness and trust in institutions and organizations are positively correlated with altruism within the prospective blood donor population in Brazil. Nevertheless, in accordance with previous studies, our results show that family, friends, altruistic values and networks constitute an important asset of trust and reciprocity that can be helpful for recruiting potential blood donors<sup>7,34,37,58</sup>. Moreover, altruism and response to direct appeal were associated with average and high cognitive social capital and also with high social altruism and philanthropy suggesting that altruistic values and networks constitute a positive asset of trust and reciprocity for donating blood and giving money to charity is probably positively associated with blood donation.

As expected, self-interest was associated with average and high cognitive social capital, suggesting that the decision to donate blood is motivated by family, friends, and networks, however, it might also be motivated to satisfy individual's self-interest<sup>6,41</sup>. One possible explanation to corroborate this hypothesis is that self-interest was not associated with any level of social altruism suggesting that individuals and society are independent and individuals are motivated to some level by egoism or depend on the circumstances in which relationships are created and sustained to become social structures and resources for individuals' gain<sup>11,41</sup>.

Motivations differed in strength according to gender, age, educational level, donor presentation type and past donation. Younger age, females, higher education and income level, community and repeat presenting donors were associated with altruistic reasons for blood donation in accordance with previous studies<sup>3, 5, 8</sup>. Response to direct appeal was the second most common motivator for blood donation consistent with previous studies<sup>8,46</sup>. Older age group (31 to >40 years old), repeat presenting donors and being a participant at Hemominas-Belo Horizonte were more likely to have response to direct appeal as a motivator for blood donation. There was a strong relationship among social altruism and response to direct appeal in our findings which may be related to the way we classified these questions. For instance, directly appealing to persons responding to family, friends or relatives in need of blood, might also be considered an altruistic attitude.

As expected self-interest as a motivator was the weakest of the three factors, and correlated significantly with male, age group of 26 to 30 years, lower educational and income levels, replacement and repeat donors<sup>8</sup>. Unexpectedly, this result differs from a previous study

carried out in São Paulo demonstrating that self-interest was associated with first-time and younger aged (less than 21 years old) donors<sup>8</sup>.

Self-interest motives for blood donation have been described by many authors worldwide<sup>11,14,46,47</sup>. Although blood bank procedures vary across the world, offering screening results for transfusion transmitted infections, in addition to the results of hematocrit or hemoglobin levels and blood pressure checks, might be perceived as a secondary gain and has attracted blood donors worldwide<sup>14,15,19,59</sup>. Of note, a day off is allowed by the national blood bank regulation for individuals who are approved for blood donation in Brazil<sup>60</sup>. The secondary gain is an unavoidable characteristic of the blood donation and its relevance increases particularly in low social economic settings where persons may use the blood center to check their health status. Social inequities are relevant in Brazil and heavily impact the health agenda in communities with low social development levels, in which lack of health services infrastructure usually occurs<sup>61</sup>. In this sense, self-interest was more likely to be observed among Hemope-Recife participants, a city with lower social economic status compared to Belo Horizonte and São Paulo. In summary, offering incentives such as tests for cholesterol, triglycerides, glucose or any free incentive such as tickets for football game, movies, t-shirts or a day off to attract blood donors might not be a reasonable approach for the Brazilian blood donors, who are different than donors in the US and other developed countries<sup>47,62-64</sup>.

Our study has several limitations. First we were not able to do a thorough analysis of social capital domains. Although we tried to explore distinct elements such as participation in local communities, neighborhood, family/friends, pro-activity and feelings of trust, we did not examine feelings of safety, tolerance to diversity, value of life, acts of volunteering and turnout in elections as indicators of social capital and its association with blood donation. However, it is important to point out that participating in elections is obligatory in Brazil<sup>65</sup>. Second, all measures mentioned in this paper are quantitative and the authors acknowledge that qualitative methods need to be carried out to improve our results. Nevertheless, our study has captured some form of quantitative indicator of social capital among individuals that came for blood donation.

Third, the use of a paper form self-administered questionnaire to ascertain the motivations for blood donation might be perceived as a limitation of study, as individuals may be inclined to give a socially accepted response rather than the real reason for their donation<sup>14,66,67</sup>. However, the complementary analyses with social altruism and philanthropy in addition to the two domains of the social capital has given strengths and minimized this limitation. Finally, Brazil is a country of continental dimensions with large regional and social inequalities<sup>68-70</sup>. For instance, the South and Southeast regions of Brazil have better quality of life, while the North and Northeast have a lagging economy and the lowest social indicators in the country<sup>69,70</sup>. Of note, the Brazilian health system has three subsectors: the public subsector, in which services are funded and provided by the State (the Sistema Único de Saúde, SUS-Unified Health System) created in 1988; the private subsector (for purposes profit or otherwise), in which services are funded by public and private resources, and, finally, the health insurance sub-sector, with different types of private health plans and policies, insurance, and tax subsidies<sup>71</sup>. Public and private system components are distinct, but are interconnected, and people can use the services in all three sub-sectors, depending on the ease of access or ability to pay. In 2006, 26% of the Brazilian population was paying for private health plans. Private health insurance is concentrated in the Southeast, where most healthcare companies are installed and hold the majority of the contracts<sup>71</sup>. In this sense, a cross-sectional study performed at three public blood centers in Brazil may not reflect the blood donation behavior related to different segments of the Brazilian population.



In summary, despite inherent limitations regarding the social capital concept, evidence in our study demonstrated an association between social capital and motivation for blood donation, in accordance with studies in Australia and Netherlands<sup>34,38,72</sup>. Our study confirms previous results showing that different motivations lead individuals to blood donation. These motivations vary according to gender, age, marital status, type of presenting donors and history of past donation. Nevertheless, our study showed that cognitive social capital and to a lesser extent, structural social capital, philanthropy and social altruism, are factors that may lead persons to donate blood. Blood bank managers should take into account these multifactorial aspects to design marketing campaigns focusing on attracting potential blood donors more efficiently. For instance, blood donation campaigns targeting sports associations, volunteers and benevolent institutions might provide good source of reliable blood donors.

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### Appendix

**Table A**

Cognitive social capital questions

Cognitive questions	Answer choices	Intended meaning
1. In the past 12 months, have you told someone in your neighborhood about any personal problem(s) that you might have had?	Yes No Don't Know	To understand trust between the respondent and his/her neighbors
2. In your neighborhood, people know each other. 3. In your neighborhood, people care about each other. 4. In your neighborhood, people do share the same values 5. In your neighborhood, there are neighbors that could give financial support in case you needed it. 6. In your neighborhood, there are neighbors that would inform you about a job opportunity. 7. Do you think that you belong to this neighborhood? 8. People in this area actively participate in the neighborhood association or community group. 9. In your neighborhood, there are neighbors that could donate	Totally agree Agree Disagree Totally disagree Don't Know	These questions are about the feeling of trust

Cognitive questions	Answer choices	Intended meaning
blood to help other neighbors.		
10. Have you helped carry a stranger's belongings? 11. Have you allowed someone to go ahead of you in a line? 12. Have you offered to help a handicapped or elderly person across a street?	Yes No Don't Know	These questions are about cooperation and support
13. In the past 12 months, have you or any of your family members, received help from neighbors when you/they have needed it?	Yes No Don't Know	To understand if the respondent received any help (emotional or social support) from his/her neighbors
14. Do you give money to charity?	Yes No Don't Know	To understand about giving money to charity as a measure of social involvement
15. Do you donate time or money to causes you believe in?	Yes No Don't Know	To understand if the respondent spends time or money for social causes.

Table B

## Structural social capital questions

Structural questions	Answer choices	Intended meaning
1. Do you belong or attend meetings of any of the following groups or organizations, networks, associations, including any non-governmental organizations? (Trade or Labor Union/ Political parties or movements; Educational groups/Cultural groups or associations; Councils /Social/Community development groups; Religious or spiritual groups; Self-help groups; Neighborhood/village committees/groups for the elderly; Other (Specify))	Check all that apply	To understand if the respondent participates in one or more social groups or organizations
2. In the past 12 months, have you actively participated in some type of volunteer work to benefit your community or neighborhood?	Yes No No, but I would No, and I never would Don't Know	To understand if the respondent helped other members of the community
3. In the past 12 months, have you gotten together with other neighbors to try to solve some problem that is affecting the area that you are living in?	Yes No No, but I would No, and I never would Don't Know	To understand if the respondent is linked with his/her neighbors
4. People in this area actively participate in campaigns and	Totally agree Agree Disagree Totally disagree	To understand if the respondent participates in campaigns and

Structural questions	Answer choices	Intended meaning
elections.	Don't Know	elections.

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**Table 1**

Demographics and Respondents Characteristics by Blood Center\*

Characteristic	Recife n (%)	Belo Horizonte n (%)	São Paulo n (%)	Total n (%)
<b>Gender</b>				
Female	570 (23.6)	1,062 (41.7)	1,079 (40.4)	2,711 (35.5)
Male	1,845 (76.4)	1,485 (58.3)	1,594 (59.6)	4,924 (64.5)
<b>Age (in years)</b>				
18–25	675 (28.0)	798 (31.3)	610 (22.8)	2,083 (27.3)
26–30	495 (20.5)	541 (21.2)	487 (18.2)	1,523 (20.0)
31–39	601 (24.9)	631 (24.8)	744 (27.8)	1,976 (25.9)
40 +	644 (26.7)	577 (22.7)	832 (31.1)	2,053 (26.9)
<b>Donor Type</b>				
Community	552 (22.9)	1,152 (45.2)	1,977 (74.0)	3,681 (48.2)
Replacement	1,387 (57.4)	825 (32.4)	298 (11.2)	2,510 (32.9)
Deferral	476 (19.7)	570 (22.4)	398 (14.9)	1,444 (18.9)
<b>Donation History</b>				
First Time	869 (35.9)	1,033 (40.6)	889 (33.3)	2,791 (36.6)
Repeat	1,546 (64.0)	1,514 (69.4)	1,784 (66.7)	4,844 (63.4)
<b>Educational Level Completed</b>				
<Elementary school	244 (10.1)	268 (10.5)	225 (8.4)	737 (9.7)
Elementary school	513 (21.2)	445 (17.5)	300 (11.2)	1,258 (16.5)
High school	1,401 (58.0)	1,467 (57.6)	1,468 (54.9)	4,336 (56.8)
College or more	233 (9.7)	363 (14.3)	491 (18.4)	1,087 (14.2)
Missing	24 (1.0)	4 (0.2)	189 (7.1)	217 (2.9)
<b>Monthly Income</b>				
<R\$ 500 (US\$ 250)	375 (15.5)	168 (6.6)	87 (3.3)	630 (8.3)
R\$ 501–1,000 (US\$ 251– 500)	885 (36.7)	742 (29.1)	638 (23.9)	2,265 (29.6)
R\$ 1,001–3,000 (US\$ 501–1,500)	665 (27.5)	894 (35.1)	985 (36.8)	2,544 (33.3)
R\$ >3,001–6,000 (US\$ 1,501)	262 (10.8)	414 (16.3)	520 (19.4)	1,196 (15.7)
Missing	228 (9.4)	329 (12.9)	443 (16.6)	1,000 (13.1)
<b>Marital Status</b>				
Single never married	910 (37.7)	1037 (40.7)	953(35.6)	2900 (37.9)
Living together/ Married	1335 (55.3)	1199 (47.1)	1236 (46.2)	3770 (49.4)
Divorce/Separated/Widowed	137 (5.7)	134 (5.2)	208(7.8)	478 (6.3)
Missing	33 (1.4)	178 (6.9)	276 (10.3)	487 (6.3)
<b>Total</b>	2415 (31.6)	2547 (33.4)	2673 (35.0)	7635 (100)

\*P-value&lt;0.001 for all associations with Blood Center

**Table 2**

Social Capital, Donor Motivations and Social Altruism by Blood Center\*

Characteristic	Recife n (%)	Belo Horizonte n (%)	São Paulo n (%)	Total n (%)
<b>Cognitive Social Capital</b>				
<b>Low</b>	410 (17.0)	613 (24.1)	931 (34.8)	1954 (25.6)
<b>Average</b>	863 (35.7)	977 (38.4)	984 (36.8)	2824 (37.0)
<b>High</b>	1142 (47.3)	957 (37.6)	758 (28.4)	2857 (37.4)
<b>Structural Social Capital</b>				
<b>Low</b>	754 (31.2)	804 (31.6)	1041 (39.0)	2599 (34.0)
<b>Average</b>	1146(47.5)	1219 (47.9)	1207 (45.2)	3572 (46.8)
<b>High</b>	515 (21.3)	524 (20.6)	425 (15.9)	1464 (19.2)
<b>Motivation factors</b>				
<b>Altruism</b>				
<b>Low</b>	343 (14.2)	421 (16.5)	526 (19.7)	1290 (16.9)
<b>Average</b>	1054 (43.6)	1011 (39.7)	957 (35.8)	3022 (39.6)
<b>High</b>	1018 (42.2)	1115 (43.8)	1190 (44.5)	3323 (43.5)
<b>Self-interest</b>				
<b>Low</b>	487 (20.2)	1111 (43.6)	1254 (46.9)	2852 (37.4)
<b>Average</b>	920 (38.1)	936 (36.8)	873 (32.7)	2729 (35.7)
<b>High</b>	1008 (41.7)	500 (19.6)	546 (20.4)	2054 (26.9)
<b>Response to Direct Appeal</b>				
<b>Low</b>	668 (27.7)	640 (25.1)	802 (30.0)	2110 (27.6)
<b>Average</b>	773 (32.0)	774 (30.4)	797 (29.8)	2344 (30.7)
<b>High</b>	974 (40.3)	1133 (44.5)	1074 (40.2)	3181 (41.7)
<b>Behaviors in Daily Life</b>				
<b>Have you helped carry a stranger's belongings?</b>				
<b>Yes</b>	2033 (84.2)	2046 (80.3)	1992 (74.5)	6071 (79.5)
<b>No</b>	318 (13.2)	351 (13.8)	373 (14.0)	1042 (13.7)
<b>DK</b>	58 (2.4)	74 (2.9)	65 (2.4)	197 (2.6)
<b>Missing</b>	58 (2.4)	74 (2.9)	65 (2.4)	197 (2.6)
<b>Have you allowed someone to go ahead of you in a line?</b>				
<b>Yes</b>	2343 (97.0)	2412 (94.7)	2399 (89.8)	7154 (93.7)
<b>No</b>	42 (1.7)	54 (2.1)	29 (1.1)	125 (1.6)
<b>DK</b>	23 (1.0)	25 (1.0)	10 (0.4)	58 (0.8)
<b>Missing</b>	7 (0.3)	56 (2.2)	235 (8.8)	298 (3.9)
<b>Have you offered to help a handicap or elderly person across a street?</b>				
<b>Yes</b>	2208 (91.4)	2171 (85.2)	2094 (78.3)	6473 (84.8)
<b>No</b>	140 (5.8)	236 (9.3)	257 (9.6)	633 (8.3)
<b>DK</b>	58 (2.4)	74 (2.9)	83 (3.1)	215 (2.8)
<b>Missing</b>	9 (0.4)	66 (2.6)	239 (8.9)	314 (4.1)
<b>Do you give money to charity?</b>				
<b>Yes</b>	786 (32.6)	816 (32.0)	798 (29.9)	2400 (31.4)

Characteristic	Recife n (%)	Belo Horizonte n (%)	São Paulo n (%)	Total n (%)
<b>No</b>	1523 (63.1)	1611 (63.3)	1590 (59.5)	4724 (61.9)
<b>DK</b>	98 (4.1)	54 (2.1)	47 (1.8)	199 (2.6)
<b>Missing</b>	8 (0.3)	66 (2.6)	238 (8.9)	312 (4.1)
<b>Social Altruism</b>				
<b>Average</b>	461 (19.1)	559 (22.0)	557 (20.8)	1577 (20.7)
<b>High</b>	1156 (47.9)	1131 (44.4)	1109 (41.5)	3396 (44.5)
<b>Philanthropic + High</b>	768 (31.8)	785 (30.8)	764 (28.6)	2317 (30.4)
<b>No/DK/Missing</b>	30 (1.2)	72 (2.8)	243 (9.1)	345 (4.5)
<b>Total</b>	2415 (31.6)	2547 (33.4)	2673 (35.0)	7635 (100)

\* P-value<0.001 for all associations with Blood Center

**Table 3**

Multivariable Logistic Regression Analysis Results for Factors Associated with High Compared to Average or Lower Altruism, Self-interest and Response to Direct Appeal Donor Motivations.

	High Altruism	High Self-interest	High Response to Direct Appeal
Variables	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)
<b>Gender</b>			
Female	1.0	1.0	1.0
Male	<b>0.8 (0.7 – 0.9)</b>	<b>1.4 (1.2 – 1.5)</b>	0.9 (0.8 – 1.0)
<b>Age</b>			
18–25	1.0	1.0	1.0
26–30	0.9 (0.8 – 1.0)	<b>1.2 (1.0 – 1.4)</b>	1.1 (1.0 – 1.3)
31–39	<b>0.7 (0.6 – 0.8)</b>	1.1 (0.9 – 1.3)	<b>1.3 (1.1 – 1.5)</b>
40+	<b>0.6 (0.5 – 0.8)</b>	1.2 (1.0 – 1.4)	<b>1.4 (1.2 – 1.6)</b>
<b>Marital Status</b>			
Living together/Married	1.0	1.0	1.0
Single, never married	1.0 (0.9 – 1.1)	0.9 (0.8 – 1.1)	1.0 (0.9 – 1.2)
Separated/Divorced/Widowed	1.2 (1.0 – 1.5)	1.0 (0.8 – 1.2)	0.9 (0.8 – 1.1)
<b>Education</b>			
Less than elementary school	<b>0.7 (0.6 – 0.9)</b>	<b>1.5 (1.2 – 1.8)</b>	0.9 (0.7 – 1.0)
Elementary school	<b>0.7 (0.6 – 0.8)</b>	<b>1.1 (1.2 – 1.8)</b>	0.9 (0.8 – 1.0)
High school	1.0	1.0	1.0
College or more	<b>1.3 (1.2 – 1.6)</b>	0.7 (0.6 – 0.8)	1.0 (0.8 – 1.1)
<b>Income</b>			
Less than R\$500(US\$250)	0.8 (0.7 – 1.0)	<b>1.7 (1.4 – 2.0)</b>	1.0 (0.9 – 1.3)
Between R\$ 501 and R\$ 1,000 (US\$ 251–500)	<b>0.8 (0.7 – 0.9)</b>	<b>1.3 (1.1 – 1.5)</b>	<b>0.9 (0.8 – 1.0)</b>
Between R\$ 1,001 and R\$ 3,000 (US\$ 501– 1500)	1.0	1.0	1.0
More than R\$ 3,001 (US\$ 1501)	<b>1.2 (1.1 – 1.4)</b>	<b>0.6 (0.5 – 0.7)</b>	1.1 (1.0 – 1.3)
<b>Blood center Location</b>			
São Paulo	1.0	1.0	1.0
Belo Horizonte	0.9 (0.8 – 1.1)	<b>0.8 (0.6 – 0.9)</b>	<b>1.2 (1.1 – 1.3)</b>
Recife	0.9 (0.8 – 1.1)	<b>1.2 (1.0 – 1.4)</b>	0.9 (0.8 – 1.0)
<b>Donor Presentation Type</b>			
Donors	1.0	1.0	1.0
Community	1.0	1.0	1.0
Replacement	<b>0.8 (0.7 – 0.8)</b>	<b>1.2 (1.0 – 1.4)</b>	1.0 (0.9 – 1.1)
Deferrals	<b>0.8 (0.7 – 1.0)</b>	1.0 (0.8 – 1.1)	0.9 (0.8 – 1.1)
<b>Donation Status</b>			
Repeat	1.0	1.0	1.0
First-time	<b>0.7 (0.6 – 0.8)</b>	<b>0.9 (0.8 – 1.0)</b>	<b>0.6 (0.5 – 0.6)</b>
<b>Cognitive Social Capital</b>			
Low	1.0	1.0	1.0
Average	<b>1.2 (1.1 – 1.4)</b>	<b>1.4 (1.2 – 1.7)</b>	<b>1.4 (1.3 – 1.7)</b>



	High Altruism	High Self-interest	High Response to Direct Appeal
Variables	AOR (95%CI)	AOR (95%CI)	AOR (95%CI)
High	<b>2.1 (1.8– 2.5)</b>	<b>2.7 (2.3– 3.2)</b>	<b>2.2 (1.9– 2.6)</b>
<b>Structural Social Capital</b>			
Low	1.0	1.0	1.0
Average	<b>1.4 (1.3 – 1.6)</b>	1.1 (0.9 – 1.2)	1.0 (0.9 – 1.1)
High	<b>1.4 (1.2 – 1.6)</b>	0.9 (0.8 – 1.1)	0.9 (0.8 – 1.0)
<b>Social Altruism</b>			
Average	1.0	1.0	1.0
High	<b>1.2 (1.0– 1.3)</b>	1.1 (0.9– 1.2)	<b>1.3 (1.2 –1.5)</b>
Philanthropic + High	<b>1.2 (1.0 – 1.4)</b>	1.1 (0.9 – 1.3)	<b>1.4 (1.2 – 1.6)</b>
No/DK/Missing	<b>0.7 (0.5 – 1.0)</b>	0.9 (0.6 – 1.3)	0.8 (0.6 – 1.1)