Received: 12 September 2022 | Revised: 11 October 2022 | Accepted: 11 October 2022

DOI: 10.1111/trf.17162

BLOOD DONORS AND BLOOD COLLECTION

TRANSFUSION

# Blood donation motivators and barriers reported by young, first-time whole blood donors: Examining the association of reported motivators and barriers with subsequent donation behavior and potential sex, race, and ethnic group differences

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**Funding information**
National Heart, Lung, and Blood Institute, Grant/Award Number: R01HL127766

## Abstract

**Background:** A greater understanding of young, first-time donor motivators and barriers is needed to address the ongoing challenge of retaining these essential donors.

**Study Design and Methods:** Structured interviews conducted with 508 young, first-time whole blood donors [66.1% female; Mean Age = 19.4 (SD = 2.5) years] were coded to identify reported motivators and barriers. Reported motivators and barriers were then examined for their association with attempted donation behavior over a 14-month follow-up, and for potential sex, race, and ethnic group differences in the frequency of endorsement.

**Results:** Prosocial motivation (e.g., altruism) was the most commonly reported motivator and fear (e.g., fainting, needles) was the most commonly reported barrier. Donation behavior was unrelated to reported motivators, but was significantly related to four reported barriers including fear of fainting/dizziness, fear of needles/pain, having personal commitments that conflict with donating, and perceiving oneself as unsuited to donate for health reasons. Sex, racial, and ethnic differences were noted with respect to the percentages of donors reporting several donation-related motivators and barriers.

**Conclusion:** The present findings identify donation-related barriers that could be important targets to address in the effort to encourage new young donors and to retain these new donors for the long term. Importantly, these data also

**Abbreviations:** ANOVA, analysis of variance; blood donor CARE, blood donor competence, autonomy, and relatedness enhancement; M, mean; REDCap, Research Electronic Data Capture; s, seconds; SD, standard deviation; US, United States.

highlight the importance of considering individual differences in donor motivation as a function of sex, race, and ethnicity.

KEYWORDS
donation barriers, donation motivators, ethnicity, first-time donors, race, sex

## 1 | INTRODUCTION

Nearly 12 million units of blood are collected in the US each year to satisfy the constant demand for transfusions.[1] Indeed, transfusions are performed every 3 s, making it one of the most common medical procedures.[2] Because the only source for blood is a living donor, the continuous demand for life-saving transfusions can only be met by a steady stream of volunteer blood donors. The current reality is that the US blood supply suffers from chronic challenges, such as seasonal shortfalls in collections and limited supplies of O negative red blood cells, and these challenges are likely to intensify as the need for blood products grows due to shifting population demographics. Simply put, our aging population will need more blood.[3] Unfortunately, the donor pool is aging along with the general population and this is reflected in a steadily increasing mean age of blood donors.[4,5]

The National Blood Collection and Utilization Survey reveals an alarming trend of decreasing donations among young donors.[4,5] Whereas prior efforts to expand the donor pool have been successful in recruiting large numbers of younger donors,[3] retention of these new donors has been a significant problem.[6–8] As a result, our blood supply has become increasingly reliant on older donors and new donors must be continually replaced because they typically fail to return. The ongoing failure to retain young, first-time donors is accompanied by a concomitant lack of knowledge about the potentially unique factors that encourage or discourage continued giving among our most recent donors. Accordingly, novel information is needed regarding the motivators and barriers that relate to retention among new donors, and particularly within their first year of giving as the number of donations within this year is positively related to long-term commitment.[7]

As part of the blood donor CARE project,[9,10] interviews were conducted with a subsample of participants who were encouraged to reflect on their motivations for giving. The present study analyses data from a subset of first-time whole blood donors who completed the interview, with the primary goal of examining the relationship between expressed motivators and barriers and attempted donation behavior over a 14-month follow-up period. Exploratory analyses were also conducted to examine potential sex, race, and ethnic group differences in the frequency of endorsement of different blood donation motivators and barriers.

## 2 | MATERIALS AND METHODS

### 2.1 | Recruitment and participants

Data for the present study were drawn from a subset of the participants in the blood donor CARE trial.[9,10] Invitations to participate in the CARE trial were emailed between 5/27/2016 and 6/10/2019, with study enrollment closed on 6/19/2019 when a sufficient sample had been recruited. Eligible individuals for the trial included all whole blood donors who were identified as being first-time donors with New York Blood Center in the previous week, 16–24 years old at the time of donation, and eligible to donate again. In addition, those contacted had to be willing to be randomly assigned to an intervention group, and have or be willing to establish a Facebook account. Exclusion criteria from the trial included a self-report of having more than one previous donation (with New York Blood Center or other blood collection agencies).

The sample for the present study included 508 participants from the blood donor CARE trial who completed a scripted telephone interview that was later transcribed for the present analyses. The interviews, which were conducted by undergraduate and graduate students trained and supervised by licensed clinical psychologists, focused on the respondents' perceived motivators and barriers for donating blood and how their personal goals and values related to their decision to donate. These 508 interviewees had a mean age of 19.4 years (SD = 2.5) and self-identified as female (66.1%), male (33.3%), or transgender (0.6%). With respect to race, participants self-identified as white (56.5%), Asian or Asian-American (16.1%), Black or African-American (8.7%), American Indian or Alaskan Native (0.6%), Hawaiian or other Pacific Islander (0.6%), or More than one race or Other (17.5%). In addition, 24.8% of the sample self-identified as Hispanic or Latino.

### 2.2 | Procedure

All interactions with participants in the blood donor CARE trial were via email, telephone, and social media, and study data were collected and managed using Research Electronic Data Capture (REDCap)[11,12] tools hosted at Ohio University. Study invitations were sent by email in the week following eligible donations. Interested

donors (and the parents of minor-age donors) were directed to the study website where a full study description was available. Donors who provided informed consent (or parental informed consent and assent for minor-age donors) were then linked to the online baseline assessment materials. After completion of the baseline assessment, the REDCap system automatically randomized respondents to one or more of four conditions: (1) Control, (2) Competence, (3) Autonomy, and (4) Relatedness. Individuals assigned to the Control condition received the standard New York Blood Center first-time donor communications. Participants who were not assigned to the Control condition were randomized to receive one, two, or all three of the active interventions. Individuals assigned to the Competence condition were instructed to review a donor coping website that provided text, videos, and interactive features to directly address common donor fears and offer empirically validated coping strategies to reduce fear, pain, and syncopal reactions.[13] Individuals assigned to the Autonomy condition participated in a telephone-based interview where they were encouraged to reflect on their motivations for giving and how the act of donating is consistent with their broader life goals and values.[14] Those assigned to the Relatedness condition were asked to join a private Facebook group for one month where discussion of donation, social interaction around donation experiences, and feelings of affiliation among group members were encouraged.[15] Participants who completed their assigned intervention(s) were emailed a link to the post-intervention survey six weeks after completion of their baseline assessment. To encourage participation and retention, participants who completed their assigned intervention(s) and the post-intervention survey received a check for US$100. The donor database of New York Blood Center was used to track subsequent donation attempts for participants who had completed the baseline and post-intervention surveys. The follow-up window included the 421 days after each participant's initial donation (to allow for a one-year follow-up after an eight-week waiting period for whole blood donation) and the last follow-up window closed on 7/31/2020. A complete report of the full clinical trial methods[9] and results[10] are available elsewhere. All procedures were approved by the Institutional Review Boards of Ohio University and New York Blood Center. The full study was registered with ClinicalTrials.gov (NCT02717338).

## 2.3 | Data processing

For the purpose of the present study, data analysis focused on the specific questions within the telephone interview that asked participants to reflect on their recent blood donation (i.e., "What were some of the reasons you donated blood?") and their future donation intentions if they indicated that they would give again (i.e., "What about your last donation experience helped you to make the decision to donate again?"; "Sometimes people who give blood have reservations about returning. What concerns do you have about giving blood again?") or would not give again (i.e., "What are some of the reasons you don't plan to give blood again?"). After approximately 10% of the 508 available audio files were transcribed, two data coders independently attempted to classify the motivator and barrier statements from these interviews into categories suggested in the literature.[16,17] Because unique motivators and barriers emerged that were not encompassed by the existing categories, additional categories were developed through discussions among the laboratory research team (including two senior researchers, two graduate students, and one undergraduate research assistant). The final coding scheme included 11 categories (with 43 subcategories) of possible motivators (see Table 1) and 12 categories (with 40 subcategories) of possible barriers (see Table 2). The two data coders proceeded to independently review all of the audio transcriptions and to categorize the relevant statements made by participants using NVivo 12 coding software (QSR International, Melbourne, Australia). Statements were first classified as either a motivator or barrier, and then further coded into appropriate categories and subcategories. After both data coders had categorized all of the statements, inter-rater reliability was assessed by comparing the two data sets using Cohen's Kappa statistics calculated at the category and subcategory levels. The resulting Kappa values were strong[18]: 0.90 at the category level and 0.86 at the subcategory level. Where disagreement in categorization occurred, the two data coders discussed the inconsistency and attempted to arrive at a joint decision. On three occasions the original coders could not reach consensus and a third independent coder chose between the two options assigned by the primary data coders.

## 2.4 | Statistical analyses

One-way analyses of variance (ANOVAs) were used to examine potential differences in the total number of blood donation motivators and barriers reported. Chi-Square Tests or Fisher's Exact Test were used to examine potential group differences in the frequency of endorsement of blood donation motivators and barriers categories, with subsequent subcategory analyses conducted when significant category-level effects were observed.

**TABLE 1** Definitions and proportion of sample who reported each of the blood donation motivation categories and subcategories.

| Category | Definition | *n* (%) Endorsing | Sub-category | Definition | *n* (%) Endorsing within category |
|---|---|---|---|---|---|
| Prosocial motivation | Desire to have a positive impact on other people or social collectives through blood donation. | 373 (73.4%) | Altruism | Goal of increasing the welfare of one or more individuals (especially strangers) through blood donation without regard for social or material rewards. | 353 (94.6%) |
| | | | Collectivism (community) | Goal of increasing the welfare of a group or collective through blood donation (target group is donor's community). | 30 (8.0%) |
| | | | Collectivism (friends and family) | Goal of increasing the welfare of a group or collective through blood donation, without explicit mention of a blood product having been received by friends or family in the past (target group is donor's friends and/or family). | 7 (1.9%) |
| | | | Role modeling | Goal of setting a good example for others around them. | 2 (0.5%) |
| Subjective experience | Prior experience donating/attempting to donate blood. | 331 (65.2%) | Positive experience | Donor reported a good overall experience. | 237 (71.6%) |
| | | | Lack of negative experience | Donor reported not having any aversive reactions during donation. | 219 (66.2%) |
| | | | Prior deferral | Donor was previously turned away from donating, which motivated them further. | 5 (1.5%) |
| Convenience | Ability to accomplish a task with little effort or difficulty. | 232 (45.7%) | Location | Blood collection site is easily accessible. | 140 (60.3%) |
| | | | Time | Wait times and/or opening hours compatible with donor's schedule. | 134 (57.8%) |
| Social norms | Expectations, obligations, and sanctions currently anchored in social groups. | 230 (45.3%) | Descriptive norms | Implicit social pressure. Significant others in the donor's social circle (family, friends, coworkers) are blood donors. | 150 (65.2%) |
| | | | Injunctive norms | Explicit social pressure. Significant others in the donor's social circle (family, friends, coworkers) requested that the individual donate blood. | 62 (27.0%) |
| | | | Social support | Donor feels a sense of support provided by the presence of friends/family/others during the donation process. | 40 (17.4%) |
| Service experience | Satisfaction with the service provided by collection agency. | 206 (40.6%) | Staff | Satisfying interactions with employees of the blood collection agency. | 199 (96.6%) |
| | | | Servicescape | Satisfaction with atmosphere of donation site. | 30 (14.6%) |
| Internal motivation | Blood donation addresses personal goals or needs. | 181 (35.6%) | Intrinsic motivation | An internal need or desire that motivates action toward donation. | 106 (58.6%) |
| | | | Impure altruism | Positive feelings/personal satisfaction derived from donating. | 63 (34.8%) |
| | | | Curiosity | Desire to investigate, observe, or gather information, particularly when the experience is novel or interesting. | 23 (12.7%) |
| | | | Self-esteem | Desire to enhance self-approval through donation. | 7 (3.9%) |
| Incentives | Events or objects that increase or induce drive or determination to donate blood. | 118 (23.2%) | Food/snacks | Food that is provided as part of the blood donation process. | 42 (35.6%) |
| | | | Learn blood type | Information provided to the donor identifying their blood type. | 38 (32.2%) |
| | | | Time off work or school | Release from work, school, or other commitments for donating blood. | 12 (10.2%) |
| | | | Work/school requirement | Donation fulfills a work or school obligation (e.g., community service). | 10 (8.5%) |

**TABLE 1** (Continued)

| Category | Definition | *n* (%) Endorsing | Sub-category | Definition | *n* (%) Endorsing within category |
|---|---|---|---|---|---|
| | | | Perceived health benefits | Belief that donation provides positive health effects. | 7 (5.9%) |
| | | | Other/generic | Donor reports being motivated by another or nonspecific incentive. | 7 (5.9%) |
| | | | Gift item | Receipt of items in exchange for donating (e.g., t-shirt, mug, etc.) | 5 (4.2%) |
| | | | Health check | Health screening provided as part of the donation process. | 5 (4.2%) |
| | | | Recognition | Collection agency acknowledgement of donor's contribution. | 3 (2.5%) |
| | | | Disease screening | Infection screening tests performed on donated blood. | 0 |
| | | | Money | Financial rewards offered for donation blood and components. | 0 |
| Perceived need for donation | Awareness that blood donation is necessary for helping people. | 117 (23.0%) | Everyday need | Awareness of the ongoing need for blood. | 79 (67.5%) |
| | | | Personal rare blood type | Awareness or belief that their blood type is rare and needed. | 26 (22.2%) |
| | | | After catastrophic events | Awareness of the need for blood in the aftermath of a disaster. | 20 (17.1%) |
| Indirect reciprocity | Donating blood in response to, or in anticipation of, an act in kind by another. | 103 (20.3%) | Upstream (friends or family) | Motivated by a significant other receiving blood in the past. | 54 (52.4%) |
| | | | Upstream (self) | Motivated after having personally received blood in the past, or personal involvement with medical profession or blood collection process. | 36 (35.0%) |
| | | | Downstream | Belief that if a person helps, there is a greater chance of receiving help oneself if needed in the future | 19 (18.4%) |
| Marketing communications | Use of promotional tools (e.g., ads, public relations, direct marketing) to recruit/retain donors. | 73 (14.4%) | Advertising | Any paid form or nonpersonal presentation and promotion of blood donation by an identified sponsor. | 37 (50.7%) |
| | | | Direct marketing | Nonpersonal or personal communication aimed at motivating donation. | 32 (43.8%) |
| | | | Blood drives | A blood collection agency and an external organization collaborate to promote and/or facilitate blood donation with employees or customers. | 4 (5.5%) |
| Personal values | Ideals that an individual deems worthwhile and that encourage donation behavior. | 42 (8.3%) | Personal moral norms | Sense of moral obligation to help others, such as by donating blood. | 29 (69.0%) |
| | | | Family tradition | Feelings of obligation due to family history of donation. | 13 (31.0%) |
| | | | Religiosity | Motivation arising from religious affiliation or spiritual commitment. | 2 (4.8%) |
| | | | Regret | Effort to avoid regret or guilt that would come with not donating. | 1 (2.4%) |
| | | | Reputation of collection agency | The extent to which the collection agency is regarded as efficient in its assistance to beneficiaries and the deployment of its resources. | 0 |

Results of Fisher's Exact Tests are reported in all cases when an expected cell count was less than 5, unless more than two groups were being compared (i.e., comparisons across four racial groups). Examination of sex differences was restricted to a comparison of female and male donors as statistical analyses could not be performed with more categories given that only three individuals identified as transgender. Similarly, examination of potential race differences compared donors who identified as Black or African-American, Asian or Asian-American, White, and More than one race or Other, but did not include donors who identified as American Indian or Alaskan Native ($n = 3$) or Hawaiian or other Pacific Islander ($n = 3$). Examination of potential ethnicity differences compared Hispanic and non-Hispanic donors. Chi-Square Tests (or Fisher's Exact Tests, as appropriate) were also used to examine whether reported motivators and barriers were related to donation behavior over the follow-up period. All analyses were conducted using IBM SPSS Statistics 28.0.1 (IBM Corp., Armonk, NY) with significant differences defined as $p < .05$.

## 3 | RESULTS

Table 1 describes the frequency of endorsement of each of the blood donation motivators and Table 2 describes the frequency of endorsement of each of the barriers in the present sample. As can be seen in Table 1, the most commonly reported motivator was prosocial motivation (including altruism, collectivism, and role modeling) and Table 2 shows that the most commonly reported barrier was fear (including fear of fainting/dizziness, needles/pain, reduced health, physical injury, contagion, blood, discovering illness, finger prick, and non-specific). It can also be seen that two barrier categories noted in the literature (i.e., ineffective incentives; personal values that discourage donation) were not raised by any of the donors.

### 3.1 | Reported motivators and barriers and subsequent attempted donation

There was no significant difference in the total number of motivators reported by those who attempted a subsequent donation (M = 4.0, SD = 1.4) versus those who did not (M = 3.9, SD = 2.2), F(1,506) = 0.34, $p = .56$. However, those who did not make a subsequent donation attempt reported significantly more barriers (M = 0.98, SD = 0.77) than those who did (M = 0.84, SD = 0.70), F(1,506) = 4.33, $p = .038$. Examination of blood donation motivator categories revealed no significant differences between those who did and did not make a subsequent donation attempt, but significant differences were observed for three barrier categories: fear [$X^2$ (1) = 13.3, $p < .001$], low self-efficacy [$X^2$ (1) = 5.27, $p = .022$], and health concern [Fisher's Exact Test, $p = .037$]. Compared to those who did not return, those who made a subsequent attempt were less likely to report a fear of fainting [17.9% vs. 26.2%, respectively, $X^2$ (1) = 5.1, $p = .024$] or a fear of needles [13.5% vs. 21.1%, respectively, $X^2$ (1) = 5.1, $p = .024$], and, surprisingly, more likely to report conflicting commitments [13.5% vs. 7.4%, respectively, $X^2$ (1) = 5.0, $p = .025$]. Finally, the health concern difference reflected a higher proportion of reports of being unsuited to donate for health reasons among those who did not make a subsequent attempt versus those who did (3.1% vs. 0.4%, respectively).

### 3.2 | Analyses of potential sex, race, and ethnicity differences in reported motivators and barriers

No significant difference was observed for the total number of motivators reported by female (M = 4.0, SD = 2.1) and male donors (M = 3.8, SD = 1.56), F(1,503) = 1.74, $p = .19$, but female donors did report more barriers to donation (M = 1.0, SD = 0.8) than male donors (M = 0.8, SD = 0.7), F(1,503) = 5.54, $p = .02$. Examination of blood donation motivator categories revealed significant sex differences for service experience [$X^2$ (1) = 10.6, $p = .001$], incentives [$X^2$ (1) = 4.5, $p = .034$], indirect reciprocity [$X^2$ (1) = 11.5, $p < .001$], and personal values [$X^2$ (1) = 10.3, $p = .001$], and significant barrier differences for fear [$X^2$ (1) = 5.7, $p = .017$] and deferral [$X^2$ (1) = 4.6, $p = .033$]. As shown in Table 3, follow-up analyses of motivator subcategories revealed that female donors were more likely than male donors to report staff treatment (44.6% vs. 29.0%, $p < .001$) and upstream reciprocity toward friends and family (13.4 vs. 5.3%, $p = .006$) as donation motivators, and male donors were more likely than female donors to identify learning their own blood type (11.2% vs. 5.7%, $p = .025$) and personal moral norms (10.1% vs. 3.3%, $p = .002$) as donation motivators. As shown in Table 4, examination of barrier subcategories revealed that female donors were more likely than male donors to report fear of fainting or dizziness (24.7% vs. 16.0%, $p = .025$), fear of reduced health (11.0% vs. 4.7%, $p = .019$), and low blood hemoglobin levels (4.8% vs. 0.6%, $p = .014$) as donation barriers.

A significant overall effect of race was observed for the number of motivators reported (White: M = 4.3, SD = 2.2; Asian: M = 3.8, SD = 1.4; Black: M = 3.6, SD = 1.2; Other or More than one race: M = 3.6, SD = 1.2), F(3,498) = 2.93, $p = .03$, but Bonferroni-

**TABLE 2** Definitions and proportion of sample who reported each of the blood donation barrier categories and subcategories.

| Category | Definition | *n* (%) Endorsing | Sub-category | Definition | *n* (%) Endorsing within category |
|---|---|---|---|---|---|
| Fear | An unpleasant emotion aroused by impending danger, pain, etc., whether the threat is real or imagined. | 241 (47.4%) | Fainting/dizziness | Fear of fainting or prodromal symptoms such as nausea and dizziness. | 112 (46.5%) |
| | | | Needles/pain | Fear of needles and the pain associated with them. | 88 (36.5%) |
| | | | Reduced health | Fear that giving blood will negatively affect energy level, resistance to disease, or health in general. | 46 (19.1%) |
| | | | Physical injury | Fear of injury by the donation needle or process. | 17 (7.1%) |
| | | | Contagion | Fear of contracting an infectious disease while donating. | 9 (3.7%) |
| | | | Blood | Fear of the sight of blood. | 8 (3.3%) |
| | | | Discovering illness | Fear that the blood screening will reveal illness. | 6 (2.5%) |
| | | | Finger prick | Fear of pre-donation finger prick used to sample blood. | 5 (2.1%) |
| | | | Nonspecific | Non-specific donation fear. | 3 (1.2%) |
| Inconvenience | The location and/or opening hours of the collection center make it difficult to donate. | 59 (11.6%) | Time | Wait times or opening hours conflict with the donor's schedule. | 45 (76.3%) |
| | | | Location | Accessibility of blood collection center location. | 21 (35.6%) |
| Low self-efficacy | Donor believes that they lack control over events that affect their lives and their own functioning, making donating seem too difficult. | 58 (11.4%) | Conflicting commitments | Donor reports commitments that make it difficult or inopportune to donate. | 53 (91.4%) |
| | | | Not enough blood to give | Donor believes their body size (or blood volume) is too small to donate. | 4 (6.9%) |
| | | | Psychological barriers | Donor lacks confidence in personal ability to donate. | 1 (1.7%) |
| Deferral | Being turned away (by the collection agency) from donating. | 40 (7.9%) | Low hemoglobin | Donor reports blood hemoglobin level below donation requirement. | 17 (42.5%) |
| | | | Low weight/height | Donor reports not meeting height/weight requirement. | 10 (25.0%) |
| | | | Travel abroad | Donor believes that their travel abroad prevents them from donating. | 6 (15.0%) |
| | | | Expected deferral | Donor expects to be deferred (for reasons other than prior deferral). | 5 (12.5%) |
| | | | Low blood pressure | Donor reports blood pressure below the required limit. | 4 (10.0%) |
| | | | Medication use | Donor reports they are unable to donate due to medication use. | 3 (7.5%) |
| | | | High pulse | Donor reports pulse is too high for donation. | 2 (5.0%) |
| | | | High blood pressure | Donor reports blood pressure above allowed limit. | 1 (2.5%) |
| | | | Prior deferral | Donor reports past deferral and believes that they will be deferred again. | 1 (2.5%) |
| | | | Tattoos | Donor believes that they cannot donate because of a tattoo. | 1 (2.5%) |

(Continues)

TABLE 2 (Continued)

| Category | Definition | *n* (%) Endorsing | Sub-category | Definition | *n* (%) Endorsing within category |
|---|---|---|---|---|---|
| | | | Men who have sex with men | Donor anticipates deferral due to policies related to men who have sex with men. | 0 |
| | | | Elevated temperature | Donor reports body temperature above allowed limit. | 0 |
| Negative service experience | Dissatisfaction with the service performance of the collection organization. | 26 (5.1%) | Staff | Dissatisfaction with interactions with blood collection staff. | 19 (73.1%) |
| | | | Servicescape | Dissatisfaction with donation site atmosphere. | 8 (30.8%) |
| Lack of knowledge | Lack of information and understanding about the need and/or process of blood donation. | 13 (2.6%) | Donation site | Lack of knowledge as to where to donate. | 13 (100%) |
| | | | Need for blood | Unaware of need for blood. | 0 |
| Negative attitudes | A mental position or feeling toward certain ideas, facts, or persons. | 11 (2.2%) | Cynicism | Frustration, disillusionment, or distrust of blood collection agencies, including concern donated blood may not be used. | 11 (100%) |
| | | | Negative word of mouth | Received negative comments about blood donation from others. | 0 |
| | | | Outgroup prejudice | Negative attitudes toward specific groups discourages prosocial behavior toward others. | 0 |
| Health concern | Donor has a belief or has been told that blood donation would not be appropriate for health reasons. | 9 (1.8%) | Not suited | | 9 (100%) |
| Lack of marketing communications | An absence of promotional tools such as advertising, public relations, personal selling, sales promotion, and direct and online marketing to recruit and/or retain donors. | 2 (0.4%) | No retention marketing efforts | | 2 (100%) |
| Low involvement | A lack of general interest in blood donation, or the lack of perceived relevance of the activity based on inherent needs, values, and interests. | 1 (0.2%) | No interest in donating | | 1 (100%) |
| Ineffective incentives | Events or objects offered as rewards fail to increase motivation to donate. | 0 (0%) | Unwanted | Rewards offered are not wanted by the donor. | 0 |
| | | | Inadequate | Rewards offered are considered insufficient or lacking in quality or quantity. | 0 |
| Personal values | Set of ideals that an individual deems worthwhile and that discourages donation behavior. | 0 (0%) | Personal moral norms | Sense of moral obligation to avoid specific behaviors such as blood donation. | 0 |
| | | | Religiosity | Discouraged from donating based on religious affiliation or spiritual commitment. | 0 |

corrected post-hoc tests did not reveal any significant differences when comparing individual racial groups. No significant racial differences were observed for the total number of barriers reported, $F(3,498) = 0.68$, $p = .56$. Examination of potential race differences in reported blood donation motivator and barrier categories revealed a significant motivator difference for service experience [$X^2$ (1) = 9.4, $p = .024$] and a significant barrier difference for deferral [$X^2$ (1) = 8.8, $p = .032$]. Examination of the service experience subcategories (see Table 3) revealed a race difference for the staff subcategory [$X^2$ (1) = 9.3, $p = .025$], with follow-up analyses indicating that White donors were more likely to report staff treatment as a motivator as compared to Asian donors (44.6% vs. 31.7%, respectively, $p = .04$) or Multiracial donors (44.6% vs. 29.2%, respectively, $p = .01$), but not Black donors (44.6% vs. 36.4%, respectively, $p = .31$). Despite the observed difference at the category level for deferral, follow-up analyses of the subcategories revealed no significant race differences (see Table 4).

Non-Hispanic donors reported more donation motivators (M = 4.1, SD = 2.0) than Hispanic donors (M = 3.6, SD = 1.3), $F(1,506) = 5.65$, $p = .02$, but there was no significant difference in the number of donation barriers reported by non-Hispanic (M = 0.9, SD = 0.7) and Hispanic donors (M = 0.9, SD = 0.7), $F(1,506) = 0.61$, $p = .44$. Examination of blood donation motivator categories revealed significant ethnicity differences for subjective experience [$X^2$ (1) = 4.74, $p = .029$] and convenience [$X^2$ (1) = 3.87, $p = .049$], but no significant ethnicity differences for donation barrier categories. Examination of the subjective experience subcategories (see Table 3) revealed an ethnicity difference for lack of negative experience [$X^2$ (1) = 4.6, $p = .032$], with non-Hispanic donors more likely to report a lack of negative experience as a motivator as compared to Hispanic donors (45.8% vs. 34.9%, respectively). Examination of the convenience subcategories revealed an ethnicity difference for location convenience [$X^2$ (1) = 5.0, $p = .025$], with non-Hispanic donors more likely to report location convenience as a motivator as compared to Hispanic donors (30.1% vs. 19.8%, respectively).

## 4 | DISCUSSION

In the present sample of racially and ethnically diverse, young, first-time blood donors, prosocial motivation emerged as the most identified motivator, suggesting that increasing the welfare of others is generally salient among young donors. Indeed, such internal motivators have been shown to be effective target points to enhance donation intention for both young donors and nondonors alike.[19] Overall, the number of reported motivators by an individual did not significantly impact the likelihood of subsequent donation attempts. Further, those who reported subsequent donation attempts were not more likely to identify any specific motivators at a higher rate compared to those who did not attempt. This aligns with prior work showing that intention to donate is likely more related to the quality (i.e., strength) of one's motivation and perceived ability to cope with barriers,[13,20,21] rather than the sheer quantity of relevant factors.

As supported throughout the blood donation literature,[16] fear emerged as the most identified barrier category and those with subsequent donation attempts were less likely to report fear of fainting or dizziness (17.9% vs. 26.2%) or needles/pain (13.5% vs. 21.1%), and concern that they were not suitable donors due to personal health issues (0.4% vs. 3.1%) compared to those who did not attempt. Because we also had information on whether these first-time donors experienced a vasovagal reaction during their initial donation, we ran additional analyses to examine whether this experience was related to the reported barriers that predicted a reduced likelihood of future donation. Results of these analyses indicated that those with a prior donation-related vasovagal reaction were considerably more likely to report fear of fainting/dizziness as a barrier to future donation than donors who did not have a vasovagal reaction (67.4% vs. 17.7%, $p < .001$). No significant differences were observed for the other reported barriers. Thus, as we have observed in prior studies,[22–25] the experience of vasovagal reactions during blood donation is an important impediment to donor retention, and the present findings suggest that this is related to fear of a recurrence.

Interestingly, those who were more likely to subsequently attempt donation were more likely to report conflicting commitments (13.5%) compared to those who did not attempt (7.4%). One might expect the opposite, namely that a higher proportion of those who reported conflicting commitments as a barrier to future donation would fail to return during the follow-up period. However, it may be that people who have a busy lifestyle with many commitments are more willing to fit donation into their already active routine ("if you want to get something done, assign it to a busy person"). This finding may also indicate that some barriers, such as conflicting commitments, are easier for motivated donors to overcome on their own as compared to other barriers, such as donation-related fear. At a minimum, the present data suggest that in order to enhance donor retention more effort should be devoted to addressing donor fears rather than reported conflicting commitments.

Regarding sex, a higher number of female donors identified staff treatment and upstream reciprocity

**TABLE 3** Percentage of respondents reporting each of the motivator subcategories as a function of attempted donation, sex, race, and ethnicity.

| | | Attempted donation | | Sex | | Race | | | | Ethnicity | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **Subcategory** | **Yes** $n = 252$ | **No** $n = 256$ | **Male** $n = 169$ | **Female** $n = 336$ | **Black** $n = 44$ | **Asian** $n = 82$ | **White** $n = 287$ | **Multiracial** $n = 89$ | **Hispanic** $n = 126$ | **Non-Hispanic** $n = 382$ |
| Prosocial motivation | Altruism | 69.8 | 69.1 | 69.2 | 69.6 | 70.5 | 64.6 | 70.7 | 68.5 | 69.8 | 69.4 |
| | Collectivism (community) | 6.7 | 5.1 | 5.9 | 6.0 | 11.4 | 9.8 | 5.2 | 2.2 | 4.8 | 6.3 |
| | Collectivism (friends and family) | 1.6 | 1.2 | 2.4 | 0.9 | 0.0 | 3.7 | 1.4 | 0.0 | 0.8 | 1.6 |
| | Role modeling | 0.4 | 0.4 | 0.0 | 0.6 | 2.3 | 0.0 | 0.3 | 0.0 | 0.0 | 0.5 |
| Subjective experience | Positive experience | 47.6 | 45.7 | 46.2 | 47.3 | 40.9 | 43.9 | 48.1 | 48.3 | 43.7 | 47.6 |
| | Lack of negative experience | 46.0 | 40.2 | 42.6 | 42.9 | 38.6 | 45.1 | 46.0 | 34.8 | 34.9 | 45.8 |
| | Prior deferral | 0.0 | 2.0 | 1.2 | 0.6 | 0.0 | 1.2 | 1.4 | 0.0 | 0.0 | 1.3 |
| Convenience | Location | 27.4 | 27.7 | 23.1 | 29.8 | 15.9 | 25.6 | 31.7 | 22.5 | 19.8 | 30.1 |
| | Time | 26.2 | 26.6 | 26.0 | 26.8 | 27.3 | 20.7 | 27.5 | 27.0 | 26.2 | 26.4 |
| Social norms | Descriptive norms | 33.7 | 25.4 | 32.0 | 28.0 | 22.7 | 37.8 | 28.2 | 30.3 | 24.6 | 31.2 |
| | Injunctive norms | 13.9 | 10.5 | 14.2 | 11.3 | 13.6 | 12.2 | 13.2 | 7.9 | 8.7 | 13.4 |
| | Social support | 7.1 | 8.6 | 5.9 | 8.9 | 4.5 | 6.1 | 8.4 | 9.0 | 7.1 | 8.1 |
| Service experience | Staff | 40.5 | 37.9 | 29.0 | 44.6 | 36.4 | 31.7 | 44.6 | 29.2 | 33.3 | 41.1 |
| | Servicescape | 6.7 | 5.1 | 4.7 | 6.5 | 11.4 | 3.7 | 5.6 | 5.6 | 7.1 | 5.5 |
| Internal motivation | Intrinsic motivation | 23.4 | 18.4 | 17.8 | 22.6 | 20.5 | 23.2 | 19.2 | 23.6 | 27.0 | 18.8 |
| | Impure altruism | 10.7 | 14.1 | 10.1 | 13.7 | 9.1 | 12.2 | 12.5 | 14.6 | 11.1 | 12.8 |
| | Curiosity | 2.8 | 6.3 | 5.3 | 4.2 | 0.0 | 8.5 | 3.1 | 7.9 | 7.1 | 3.7 |
| | Self-esteem | 1.2 | 1.6 | 1.2 | 1.5 | 0.0 | 3.7 | 1.0 | 1.1 | 0.0 | 1.8 |
| Incentives | Food/snacks | 9.1 | 7.4 | 9.5 | 7.7 | 11.4 | 3.7 | 9.4 | 6.7 | 7.9 | 8.4 |
| | Learn blood type | 6.7 | 8.2 | 11.2 | 5.7 | 2.3 | 8.5 | 7.0 | 11.2 | 10.3 | 6.5 |
| | Time off work or school | 3.6 | 1.2 | 3.6 | 1.8 | 2.3 | 0.0 | 3.5 | 1.1 | 0.8 | 2.9 |
| | Work or school requirement | 2.4 | 1.6 | 2.4 | 1.8 | 0.0 | 1.2 | 2.1 | 3.4 | 3.2 | 1.6 |
| | Perceived health benefits | 2.4 | 0.4 | 1.8 | 1.2 | 0.0 | 2.4 | 0.7 | 3.4 | 2.4 | 1.0 |
| | Other/generic | 1.6 | 1.2 | 1.8 | 1.2 | 4.5 | 1.2 | 0.3 | 2.2 | 3.2 | 0.8 |
| | Gift item | 1.2 | 0.8 | 0.6 | 1.2 | 0.0 | 1.2 | 1.0 | 1.1 | 0.8 | 1.0 |
| | Health check | 0.4 | 1.6 | 1.8 | 0.6 | 0.0 | 1.2 | 0.0 | 4.5 | 3.2 | 0.3 |
| | Recognition | 0.8 | 0.4 | 0.0 | 0.9 | 2.3 | 0.0 | 0.7 | 0.0 | 0.0 | 0.8 |
| | Disease screening | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**TABLE 3** (Continued)

| Category | Subcategory | Attempted donation | | Sex | | Race | | | | Ethnicity | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes $n = 252$ | No $n = 256$ | Male $n = 169$ | Female $n = 336$ | Black $n = 44$ | Asian $n = 82$ | White $n = 287$ | Multiracial $n = 89$ | Hispanic $n = 126$ | Non-Hispanic $n = 382$ |
| | Money | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perceived need for donation | Everyday need | 13.5 | 17.6 | 13.6 | 16.7 | 20.5 | 13.4 | 16.4 | 13.5 | 13.5 | 16.2 |
| | Personal rare blood type | 3.6 | 6.6 | 3.6 | 5.7 | 4.5 | 4.9 | 4.9 | 5.6 | 7.1 | 4.5 |
| | After catastrophic events | 5.2 | 2.7 | 3.0 | 4.5 | 0.0 | 4.9 | 4.2 | 4.5 | 5.6 | 3.4 |
| Indirect reciprocity | Upstream (friends or family) | 8.3 | 12.9 | 5.3 | 13.4 | 4.5 | 4.9 | 13.2 | 9.0 | 12.7 | 9.9 |
| | Upstream (self) | 8.7 | 5.5 | 4.7 | 8.3 | 2.3 | 4.9 | 9.4 | 4.5 | 3.2 | 8.4 |
| | Downstream | 4.4 | 3.1 | 1.8 | 4.8 | 4.5 | 3.7 | 2.8 | 6.7 | 5.6 | 3.1 |
| Marketing communications | Advertising | 7.1 | 7.4 | 4.1 | 8.9 | 15.9 | 6.1 | 8.4 | 1.1 | 5.6 | 7.9 |
| | Direct marketing | 5.2 | 7.4 | 7.1 | 6.0 | 0.0 | 4.9 | 8.0 | 5.6 | 4.0 | 7.1 |
| | Blood drives | 1.2 | 0.4 | 0.6 | 0.9 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 1.0 |
| Personal values | Personal moral norms | 6.3 | 5.1 | 10.1 | 3.3 | 11.4 | 3.7 | 4.9 | 7.9 | 7.1 | 5.2 |
| | Family tradition | 2.0 | 3.1 | 3.6 | 2.1 | 0.0 | 3.7 | 2.4 | 3.4 | 1.6 | 2.9 |
| | Religiosity | 0.4 | 0.4 | 0.6 | 0.3 | 0.0 | 1.2 | 0.0 | 1.1 | 0.8 | 0.3 |
| | Regret | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| | Collection agency reputation | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

*Note*: Shaded cells represent a significant difference observed at the subcategory level.

**TABLE 4** Percentage of respondents reporting each of the barrier subcategories as a function of attempted donation, sex, race, and ethnicity.

| | | Attempted donation | | Sex | | Race | | | | Ethnicity | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Category** | **Subcategory** | **Yes** $n = 252$ | **No** $n = 256$ | **Male** $n = 169$ | **Female** $n = 336$ | **Black** $n = 44$ | **Asian** $n = 82$ | **White** $n = 287$ | **Multiracial** $n = 89$ | **Hispanic** $n = 126$ | **Non-Hispanic** $n = 382$ |
| Fear | Fainting/dizziness | 17.9 | 26.2 | 16.0 | 24.7 | 15.9 | 7.3 | 27.2 | 20.2 | 21.4 | 22.3 |
| | Needles/pain | 13.5 | 21.1 | 17.2 | 17.3 | 31.8 | 17.1 | 15.0 | 15.7 | 20.6 | 16.2 |
| | Reduced health | 6.7 | 11.3 | 4.7 | 11.0 | 15.9 | 12.2 | 7.3 | 9.0 | 8.7 | 9.2 |
| | Physical injury | 2.8 | 3.9 | 3.6 | 3.0 | 2.3 | 4.9 | 3.8 | 1.1 | 2.4 | 3.7 |
| | Contagion | 2.0 | 1.6 | 1.8 | 1.8 | 0.0 | 2.4 | 2.1 | 1.1 | 0.0 | 2.4 |
| | Blood | 1.6 | 1.6 | 1.8 | 1.5 | 2.3 | 0.0 | 2.4 | 0.0 | 0.8 | 1.8 |
| | Discovering illness | 0.8 | 1.6 | 1.8 | 0.9 | 0.0 | 2.4 | 0.3 | 3.4 | 2.4 | 0.8 |
| | Finger prick | 1.6 | 0.4 | 1.8 | 0.6 | 0.0 | 1.2 | 0.7 | 2.2 | 1.6 | 0.8 |
| | Nonspecific | 0.8 | 0.4 | 0.6 | 0.6 | 0.0 | 1.2 | 0.0 | 2.2 | 0.0 | 0.8 |
| Inconvenience | Time | 9.1 | 8.6 | 8.9 | 8.9 | 4.5 | 7.3 | 10.1 | 7.9 | 7.1 | 9.4 |
| | Location | 2.4 | 5.9 | 4.7 | 3.9 | 4.5 | 6.1 | 3.5 | 4.5 | 4.0 | 4.2 |
| Low self-efficacy | Conflicting commitments | 13.5 | 7.4 | 13.0 | 9.2 | 6.8 | 13.4 | 11.5 | 6.7 | 6.3 | 11.8 |
| | Not enough blood to give | 0.8 | 0.8 | 0.6 | 0.9 | 2.3 | 0.0 | 0.7 | 1.1 | 2.4 | 0.3 |
| | Psychological barriers | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| Deferral | Low hemoglobin | 4.0 | 2.7 | 0.6 | 4.8 | 0.0 | 3.7 | 4.9 | 0.0 | 0.0 | 4.5 |
| | Low weight/height | 0.8 | 3.1 | 0.6 | 2.7 | 0.0 | 2.4 | 2.4 | 1.1 | 0.8 | 2.4 |
| | Travel abroad | 2.0 | 0.4 | 1.2 | 1.2 | 0.0 | 2.4 | 1.0 | 1.1 | 0.8 | 1.3 |
| | Expected deferral | 1.2 | 0.8 | 1.2 | 0.9 | 0.0 | 0.0 | 1.4 | 1.1 | 1.6 | 0.8 |
| | Low blood pressure | 0.8 | 0.8 | 0.0 | 0.9 | 0.0 | 1.2 | 1.0 | 0.0 | 0.8 | 0.8 |
| | Medication use | 0.4 | 0.8 | 1.2 | 0.3 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.8 |
| | High pulse | 0.0 | 0.8 | 0.6 | 0.3 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.5 |
| | High blood pressure | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 |
| | Prior deferral | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 1.1 | 0.8 | 0.0 |
| | Tattoos | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 0.8 | 0.0 |
| | Men who have sex with men | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Elevated temperature | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**TABLE 4** (Continued)

| Category | Subcategory | Attempted donation | | Sex | | Race | | | | Ethnicity | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yes $n = 252$ | No $n = 256$ | Male $n = 169$ | Female $n = 336$ | Black $n = 44$ | Asian $n = 82$ | White $n = 287$ | Multiracial $n = 89$ | Hispanic $n = 126$ | Non-Hispanic $n = 382$ |
| Negative service experience | Staff | 3.2 | 4.3 | 2.4 | 4.5 | 4.5 | 4.9 | 3.1 | 4.5 | 2.4 | 4.2 |
| | Servicescape | 1.6 | 1.6 | 1.8 | 1.5 | 4.5 | 1.2 | 1.4 | 0.0 | 2.4 | 1.3 |
| Lack of knowledge | Donation site | 2.8 | 2.3 | 2.4 | 2.7 | 2.3 | 3.7 | 2.8 | 1.1 | 1.6 | 2.9 |
| | Need for blood | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Negative attitudes | Cynicism | 2.4 | 2.0 | 2.4 | 2.1 | 4.5 | 1.2 | 1.7 | 3.4 | 3.2 | 1.8 |
| | Negative word of mouth | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Outgroup prejudice | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Health concern | Not suited | 0.4 | 3.1 | 0.6 | 2.4 | 0.0 | 2.4 | 1.7 | 2.2 | 1.6 | 1.8 |
| Lack of marketing communications | No retention marketing efforts | 0.4 | 0.4 | 0.0 | 0.6 | 0.0 | 1.2 | 0.3 | 0.0 | 0.0 | 0.5 |
| Low involvement | No interest in donating | 0.4 | 0.0 | 0.0 | 0.3 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.3 |
| Ineffective incentives | Unwanted | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Inadequate | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Personal values | Personal moral norms | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | Religiosity | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

*Note*: Shaded cells represent a significant difference observed at the subcategory level.

toward friends and family as motivators compared to male donors. This aligns with one previous cross-sectional survey in a US sample, which found females were more motivated by feelings of empathetic concern and social responsibility when compared to male donors.[26] Further, a higher number of male donors identified learning their blood type and personal moral norms as motivators compared to female donors. This differs from the two prior studies examining sex differences in donor motivation, finding that males were more likely to report being motivated by small gifts, perceived health benefits, explicit encouragement from significant others, and the infectious disease screening provided as part of the blood donation process.[27,28] In the current study, female donors reported a higher total number of barriers and were more likely to cite fear of fainting or dizziness, fear of reduced health, and low blood hemoglobin levels compared to male donors. This suggests that the female donor pool may be especially suited for interventions designed to address and cope with syncopal reactions. Overall, there is a relative dearth of published information regarding sex differences among US blood donors, thus more work is needed to tailor recruitment and retention strategies.

Regarding racial differences, White donors were more likely to identify staff treatment as a motivator compared to Asian and Multiracial donors, but not Black donors. While this difference may suggest a need for more diverse representation and greater cross-cultural competency among collections staff, this interpretation must be tempered by the greater likelihood of female donors to report service experience as a motivator as compared to male donors. This is relevant as the proportion of female donors was higher among White donors (69.8%) than Asian donors (54.9%) or Multiracial donors (63.6%), hence the observed racial differences may be due, at least in part, to a lower proportion of female donors. Aside from the observed difference in identifying staff treatment as a motivator, the racial groups were largely homogeneous in terms of identified motivators. Of note, there are several racial differences in the blood donation literature that did not emerge in the current study. Promise of a gift item, health screening, and perceived health benefit have been identified as motivators by Black donors at a higher frequency compared to White donors.[27,29,30] However, none of the 44 Black interviewees in the current sample identified with any of these. Other motivators such as helping one's community and positive staff treatment have similarly been noted at higher rates among Black donors compared to White donors,[31] but not in the present study. Further, barriers such as reporting distrust of blood shortage claims[32] or the medical system more broadly,[33] fear of contagion,[34] and poor treatment by staff or inadequate staff skills[35] have been reported at higher rates by Black donors compared to White donors. Again, no such differences were found in the current study. The reason for the discrepancy with prior findings is not clear, but may reflect the current study's exclusive focus on first-time donors and potentially related differences in perceived concerns among a young donors. The young, urban donor population studied here may be more homogeneous in education level, social economic background, or donation-related knowledge than the groups included in some of the previous surveys examining racial differences.

Regarding ethnic differences, non-Hispanic donors reported a higher number of motivators, and more frequently identified a lack of negative experience and location convenience compared to Hispanic donors. However, no other ethnic differences emerged for any other motivators or barriers. It is important to note that New York Blood Center serves a large and diverse Hispanic population, and as noted above, the present study focused on young first time donors, hence the motivators and barriers previously identified at higher rates among Hispanic versus non-Hispanic donors may not be as relevant in the current sample.[29,36] Another feature of the present study that may have led to novel findings was the examination of responses to open-ended questions in an interactive format. Specifically, donors were given the opportunity to describe their most salient motivators and barriers, whereas a majority of prior studies used predetermined survey questions that may have limited respondent options in identifying personal concerns. A difference in level of anonymity may also have impacted the results found here compared to earlier survey studies.

Like all studies, several limitations must be kept in mind when interpreting the present findings. First, although we analyzed motivators and barriers individually, in reality donation predictors likely operate in combination and may interact with a wide range of socio-environmental factors. For example, donation attempts may be related to perceived ease of access to a donation site in combination with other psychological motivators or barriers. This is an important consideration for future research which should be designed and powered to examine how multiple factors operate in isolation and combination to shape subsequent donation behavior. Second, although the present data demonstrate that analysis of qualitative interviews can yield novel information regarding predictors of future donation, interpretation of the generalizability of the present data should be tempered by the knowledge that respondents received concomitant interventions as part of a larger trial. Finally, it is worth emphasizing that our consideration of sex, racial, and ethnic differences rests upon small subsamples of respondents recruited from a single

large metropolitan area; hence, further research is needed with larger samples that better reflect the diversity of the donor population with respect to age, race, ethnicity, and geography.

In sum, if we wish to motivate and retain the large and diverse pool of donors that will be needed to meet the growing demand for transfusions in an aging American population, additional efforts are needed to better understand the driving factors behind blood donation decisions among all potential donors.

## ACKNOWLEDGMENTS

Research reported in this publication was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health under Award Number R01HL127766. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

## CONFLICT OF INTEREST

The authors certify that they have no conflicts of interest or financial involvement with this manuscript.

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**How to cite this article:** France CR, France JL, Ysidron DW, Martin CD, Duffy L, Kessler DA, et al. Blood donation motivators and barriers reported by young, first-time whole blood donors: Examining the association of reported motivators and barriers with subsequent donation behavior and potential sex, race, and ethnic group differences. Transfusion. 2022;62(12):2539–54. https://doi.org/10.1111/trf.17162