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# Blood donor show behaviour after an invitation to donate: The influence of collection site factors

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## Vox Sanguinis

**Background and Objectives** Show behaviour after invitation to donate varies considerably across donors. More insight into this variation is important for blood banks in achieving stable stocks. This study examined individual factors determining intended show behaviour. Most importantly, however, this study is the first study to account for variation in donor behaviour *across different collection sites*.

**Materials and Methods** We applied a multilevel approach to data from Donor InSight, including 11 889 donors from 257 fixed and mobile collection sites in the Netherlands. The aim of the multilevel models was to account for variance at two levels, that is donors and collection sites. We estimated the likelihood of showing after invitation based on individual predictors, including demographics, donation history and attitude. At the collection site level, we included satisfaction with the blood bank aggregated from individual responses by donors who donate at this site, opening hours and collection site type, that is fixed/mobile.

**Results** Most importantly, show behaviour varied considerably across collection sites and depended on characteristics of these sites. Moreover, women, older and more experienced donors had higher odds of showing after invitation than men, younger and less experienced donors. Donors higher on warm glow, self-efficacy and donor identity more likely showed after an invitation. Higher aggregate satisfaction and donating at fixed collection sites increased the odds of show.

**Conclusion** In addition to individual factors, collection site characteristics are important in explaining variation in donor show behaviour, thus presenting clues for blood bank policies and interventions to improve donor show.

**Key words:** collection site characteristics, donor show behaviour, intention to donate, multilevel approach.

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## Introduction

Donor show behaviour after an invitation to donate is of utmost importance for blood establishments to guarantee stable stocks [1]. Why certain donors show up after an invitation to donate while others do not has been investigated before [1, 2], taking into account concepts from the

Theory of Planned Behavior [3] and organizational variables, such as satisfaction with the blood bank [2]. Besides, studies have investigated demographic characteristics, individual attitudes and adverse events in association with donor behaviour [4–9]. These studies have all examined *individual* determinants of donor show behaviour. Expanding on these studies, the current work examines which combination of factors determine intended show behaviour, including demographic, attitudinal and health factors and most importantly, takes into account characteristics of the different collection sites

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donors come to donate [10]. While certain characteristics such as gender, age and adverse events may be universal predictors of donor show behaviour, other characteristics might depend on the collection site. No studies to date have accounted for this dependency, that is donors nested within collection sites. Characteristics of collection sites may influence individual donor behaviour and show behaviour in particular. The mechanisms – how collection site may impinge on individual behaviour – are as follows: donors at one site share the same collection site environment; donors at one site share the same assistants/physicians; donors at one site influence each other (by communication or shared norms); and donors at one collection site may come from the same neighbourhood/municipality. For example, Wevers and colleagues [2] suggest that satisfaction with the blood bank plays a role in show behaviour. However, this satisfaction may vary across the different collection sites, due to, for example, opening hours or friendliness of the personnel. In addition, type of collection site, for example fixed sites vs mobile drives, has also been shown to associate with donor behaviour [11].

This study investigated whether demographic characteristics, personal and attitudinal factors, and collection site-related aspects, such as satisfaction with the blood bank, predict donor show behaviour after an invitation to donate. We apply a multilevel approach to data from the second wave of Donor InSight [12], including 11 889 donors from 257 different collection sites in the Netherlands. In the Netherlands, more than 80% of the donations occur at fixed sites and donors almost always donate at the same sites (close to where they live or work).

### Donor behaviour – individual and social factors

Previous work has investigated Theory of Planned Behavior concepts in association with donor behaviour [13–15] and examined specific demographic characteristics [5, 16] of blood donors compared to the general population [12] and pro-social attitudes in association with donor behaviour [17]. In addition, donation history and ‘organizational’ variables such as satisfaction with the blood bank have been taken into account [2, 10]. Donation history, that is deferrals, number of previous donations and the experience of adverse events, also determines donor show behaviour. Deferral and adverse events negatively associated with donor show behaviour, whereas the number of previous donations positively predicted show behaviour [2, 8]. These associations between individual donor characteristics, donation history and show behaviour may vary across collection sites. Based on the above-mentioned literature, we formulated the following main aim and hypotheses (H1-3).

### *Aim*

Examine variation of donor show behaviour after an invitation to donate across blood collection sites in the Netherlands.

### *H1a*

Donation history and age impact on show behaviour, such that donors with a higher number of life-time donations and older donors have higher odds of showing after invitation.

### *H1b*

Deferral negatively predicts show behaviour after an invitation to donate.

### *H2*

Higher donor identity, pro-social value orientation, donation attitude and self-efficacy positively predict showing up after an invitation to donate.

### *H3*

Collection site factors, that is higher aggregate satisfaction, more generous opening hours and collection site type (fixed), positively associate with show behaviour after an invitation to donate.

To the best of our knowledge, no study thus far investigated a combination of individual and collection site factors in order to explain donor behaviour. Hence, this study adds to the literature in two ways. It examines interplay among scattered groups of determinants, that is demographics, donation history and attitudinal factors. Most importantly, it applies a multilevel design to studying donor behaviour across collection sites in the Netherlands.

## Materials and methods

### Participants and procedure

The data for this study stem from the 2012 wave of Donor InSight (DIS), conducted at the department Donor Studies of Sanquin, the official blood collection agency in the Netherlands [12]. Ethics approval was provided by Committee Medical Research (Commissie Mensgebonden Onderzoek (CMO) Regio Arnhem-Nijmegen, the Netherlands) to the Bloodbank South-East Nijmegen, the Netherlands, for the data collection of Donor InSight (DIS). No physical health measures were included in the survey. A random sample of about 50 000 active and eligible blood donors received an invitation to participate in the survey by postal mail. Respondents participated on a voluntary basis, and all gave their written consent. The initial response rate was about 63%, and the response rate in the second round was 71%. Two anonymous

questionnaire rounds, DIS-I in 2007–2009 ( $n = 31\,338$ ) and DIS-II in 2012–2013 ( $n = 22\,132$ ), were completed to gain more insight into demographic donor characteristics, motivations and health. In this study, we use data from DIS-II whole-blood donors ( $n = 17\,385$ ; 78.5% of the DIS-II respondents). Of these whole-blood donors, 68.4% provided valid answers to all questions and variables, on both the individual and collection site level, required for our analyses ( $N = 11\,889$ ). These participants were spread over a total of 257 collection sites. The variable education, not available in the 2012 survey, was added from the 2007 wave of DIS. For more details on the procedure and design of DIS, we refer to Atsma *et al.* [12]

## Measures

In the Netherlands, whole-blood donors receive a postcard with an invitation to donate when they are eligible to donate and when their blood group is needed. After having received this postal invitation, they are requested to come to donate within a two-week period on a walk-in basis. Self-reported show behaviour after an invitation to donate served as our dependent variable. The rationale to focus on self-reported show behaviour is twofold. Theoretically, we think it is informative to examine which cognitive and emotional and contextual factors associate with simultaneously self-reported show behaviour. Empirically, our data show an underestimation of show behaviour as compared to the blood bank registry's recording the actual return. Return was measured with the question 'Does it ever occur that you do not show up after having received an invitation to donate?' Answer categories were 0 yes and 1 no. For the analyses and the results, we refer to the dependent variable as show behaviour in the sense that 1 indicates donor does show after having received an invitation to donate and 0 indicates no-show.

As we apply a multilevel design, we included measures on the individual (donor) level and on the collection site level. An overview of descriptive statistics for all study variables can be found in Table 1. For all measures, unless indicated otherwise, higher scores imply more agreement with the statement, or more endorsement of the value.

### Demographics

We included gender, age, and education. Gender was measured as 1 female and 0 male, age was measured in years and education ranged from 1 no education to 8 university degree.

### Donation history

Donation history was included as number of previous donations and having ever been deferred. A dummy

**Table 1** Descriptive statistics of study variables

Variables	% or Mean	SD	Range
Dependent variable			
Show after invitation (yes)	36.66		0/1
Individual level			
Female	53.60		0/1
Age	49.63	11.76	22–81
Education	5.55	1.63	1–8
Number of previous donations	37.01	25.98	1–227
Ever deferred (yes)	46.09		0/1
Warm glow <sup>a</sup>	−0.01	0.97	−3.52–2.51
Cognitive attitude <sup>a</sup>	0.06	0.93	−10.75–0.87
Benevolence <sup>a</sup>	−0.00	0.98	−4.28–2.29
Trust <sup>a</sup>	−0.01	0.99	−3.06–3.87
Self-efficacy <sup>a</sup>	0.00	0.99	−5.94–1.47
Donor identity <sup>a</sup>	−0.01	1.00	−3.24–2.82
Individual satisfaction <sup>a</sup>	0.00	1.00	−6.40–0.97
Collection site level			
Aggregate satisfaction	0.00	0.18	−3.19–.97
Collection site (mobile)	38.80		0/1
Opening hours	2.55	1.85	0.5–5

<sup>a</sup>These variables have been derived by principal component analysis, and therefore, standardized values (i.e. mean = 0 and SD = 1) are presented.

variable indicated whether respondents had ever been 1 deferred or 0 not deferred throughout their donor career.

### Attitudinal factors

With regard to attitudinal factors, we included attitude concerning blood donation, self-efficacy and donor identity as well as general pro-social value orientation, measured as trust and benevolence. Including six bipolar statements on *attitude towards donating* on a 5-point scale, that is 'I find giving blood... (1) annoying–enjoyable, (2) unpleasant–pleasant, (3) appealing–unappealing, (4) negative–positive, (5) good–bad, (6) meaningless–worthwhile', into principal component analysis (PCA) revealed two components that could be interpreted as cognitive and affective attitude [18]. Both components had eigenvalues above 1.0 and accounted for 67.4% of the variance. Affective attitude is akin to warm glow and can be regarded as one mechanism of altruism [19]. Therefore, this factor has been labelled warm glow.

Measures of self-efficacy and donor identity stem from the assessment of participants' views and motives of donating blood derived from the Theory of Planned Behavior [3], adapted for the blood donation context. They were based on published measures used in previous blood donor studies and included 15 statements, for example 'I consider myself able to continue to give blood as long as my health allows it' rated on a 5-point Likert scale ranging from 1 totally disagree to 5 totally agree

[9]. A full list of the rated statements can be found in Appendix 1. PCA was performed and revealed three components, all with eigenvalues above 1.0 and together accounting for 58.5% of the variance. The first component (including seven statements) and the second component (including five statements) were interpreted as self-efficacy and donor identity, respectively.

Pro-social value orientation was measured with seven statements, for example 'I prefer to work for my own welfare rather than that of others' [20, 21]. Again using PCA, two factors, both with eigenvalues above 1.0 and accounting for 53.3% of the variance, could be differentiated. The first factor comprised five items referring to altruism and egoism and was labelled benevolence. The second factor included the statements developed by Rosenberg [22] to measure misanthropy and was interpreted as generalized social trust (for more details about the measures we refer to Bekkers & Veldhuizen [23]). All scales derived from PCA were included as weighted factors scores. A full list of the rated statements can be found in Appendix 1.

### Collection site factors

On the level of collection site, we included three variables, that is aggregate satisfaction, opening hours and type of site. Aggregate satisfaction was calculated based on the individual answers of donors in Donor InSight to five statements, rated on a 5-point Likert scale ranging from 1 totally disagree to 5 totally agree, regarding their satisfaction with the donation procedure, the blood bank and its personnel. All donors who are enrolled to the same site contribute to this site's score on aggregate satisfaction. An example item is 'I consider the blood bank a professional organization'. All five items loaded on one component that was labelled as satisfaction with the blood bank. This initial component was also included as individual predictor because we were interested in the extent to which the aggregated factor differs from the individual one. By including both factors on both levels, one can distinguish between their effects in predicting donor behaviour.

Opening hours were included as a continuous score ranging from 0.5 (for mobile sites that are open one to two times a month), 1 once a week up to 5 every weekday (for fixed sites). In the Netherlands, the majority of donations (more than 80%) are collected at fixed sites. A mobile truck driving to smaller towns and villages collects the remaining 20% of donations. A dummy variable indicating collection site type was included as 0 fixed site and 1 mobile site.

### Statistical analyses

We performed descriptive analyses and correlations of the key variables for the whole sample. To test

variation in the show behaviour of donors after having received an invitation to donate, and to examine whether individual and contextual variables could reduce this variation, we conducted multilevel analyses, using the software package MLwiN [24]. A multilevel design was applied because of the hierarchical structure of the data, with individual respondents (donors) being nested within collection sites. The aim of the multilevel models was to take into account the variance estimates at the two levels, that is donors and collection sites. Because the dependent variable is a categorical one, we applied multilevel binomial logit regression analyses to estimate individual and collection site effects. All continuous measures on the donor level were grand mean-centred while the continuous collection site predictor was centred at the group level to ensure that the model intercept refers to a unit with average predictor value as well as to ensure stable estimates for the interaction effects.

## Results

The means and standard deviations of all study variables are presented in Table 1. From our respondents, about 37% indicated that they do show up after having received an invitation to donate. This self-reported measure seems valid, and even an underestimation, compared to earlier studies where, based on the Dutch donor registry about 50% of the invited donors show up to make their donation [15]. Furthermore, respondents to DIS-I and DIS-II are very similar to the general donor population regarding socio-demographic characteristics [12]. Correlation results are depicted in Table 2 and provide a first impression on associations between individual and collection site variables.

To test our hypotheses, we estimated a number of multilevel models, presented in Table 3. The first model, the *intercept only* model (cf. Model 1), allows to examine whether there is a statistically significant amount of variation in self-reported show behaviour after an invitation to donate at the collection site level. Indeed, the variation of the constant, as shown in the random part of the table, is clearly statistically significant, indicating that show behaviour varies across collection sites.

In a next step (cf. Model 2 in Table 3), predictors on the individual donor level were added to Model 1 as fixed effects. These fixed effects demonstrate the association between the predictors and the dependent variable and can be interpreted as regression coefficients [25]. In line with the first hypothesis (H1a), age and donation history significantly predicted self-reported show behaviour. Given the effects of the other predictors, more experienced and older donors were more likely to

Table 2 Correlations among study variables

Variables	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Female	-0.25***	-0.00	-0.46***	-	-0.08***	0.05***	0.13***	-0.00	0.03**	-0.03**	0.05***	-0.00	-	-0.03**	-0.01
2. Age	-	-0.26***	0.56***	0.02*	0.12***	0.03**	0.04***	0.01	0.15***	0.17***	0.06***	0.01	0.06***	-0.07***	0.15***
3. Education	-	-	-0.09***	-0.00	-0.23***	-0.03**	0.04***	-0.24***	-0.08***	-0.20***	-0.09***	-0.04***	-0.13***	0.17***	-0.14***
4. Number of prev. don.	-	-	-	0.01	0.14***	0.01	-0.03**	-0.00	0.13***	0.11***	0.03***	0.00	-0.12***	0.12***	0.18***
5. Ever deferred	-	-	-	-	0.00	0.02*	0.04***	-0.00	0.04***	0.01	0.04***	0.00	-0.05***	0.03**	0.06***
6. Warm glow	-	-	-	-	-	-0.03***	0.10***	0.12***	0.22***	0.24***	0.21***	0.05***	0.04***	-0.06***	0.16***
7. Cognitive attitude	-	-	-	-	-	-	0.09***	-0.03**	0.18***	0.05***	0.18***	0.02*	0.01	-0.01	0.03**
8. Benevolence	-	-	-	-	-	-	-	0.00	0.17***	0.19***	0.20***	0.03**	0.03**	-0.04***	0.02†
9. Trust	-	-	-	-	-	-	-	-	-0.01	0.12***	-0.03**	0.01	0.02*	-0.05***	0.06***
10. Self-efficacy	-	-	-	-	-	-	-	-	-	-0.01	0.32***	0.06***	0.05***	-0.06***	0.24***
11. Donor identity	-	-	-	-	-	-	-	-	-	-	0.13***	0.02*	0.04***	-0.05***	0.07***
12. Satisfaction	-	-	-	-	-	-	-	-	-	-	-	0.18***	-0.02	0.00	0.10***
13. Agg. satisfaction	-	-	-	-	-	-	-	-	-	-	-	-	-0.08***	0.01	0.05***
14. Type of site <sup>a</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-	-0.87***	-0.06***
15. Opening hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16. Show behaviour	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

<sup>a</sup>1 = mobile, 0 = fixed; 1 = female, 0 = male.

†  $P < 0.10$ , \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

Table 3 Multilevel models with individual and collection site variables predicting return behaviour

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Estimate	SE								
<b>Intercept</b>	<b>-0.630***</b>	<b>0.034</b>	<b>-0.976***</b>	<b>0.047</b>	<b>-0.888***</b>	<b>0.049</b>	<b>-0.705***</b>	<b>0.071</b>	<b>-0.704***</b>	<b>0.071</b>
Individual level										
Female			0.267***	0.049	0.262***	0.048	0.266***	0.048	0.265***	0.048
Age			0.005**	0.002	0.005**	0.002	0.005**	0.003	0.005**	0.002
Education			-0.104***	0.014	-0.108***	0.014	-0.108***	0.014	-0.108***	0.014
Number of previous donations			0.011***	0.001	0.011***	0.001	0.011***	0.001	0.011***	0.001
Ever deferred (yes)			0.186***	0.042	0.184***	0.041	0.181***	0.042	0.181***	0.042
Warm glow			0.158***	0.023	0.160***	0.023	0.160***	0.023	0.160***	0.023
Cognitive attitude			-0.043	0.023	-0.043	0.023	-0.042	0.023	-0.042	0.023
Self-efficacy			0.564***	0.030	0.571***	0.030	0.574***	0.030	0.573***	0.030
Donor identity			0.069***	0.022	0.071***	0.022	0.073***	0.022	0.073***	0.022
Trust			0.057***	0.021	0.058***	0.021	0.057***	0.021	0.056***	0.021
Benevolence			-0.073***	0.022	-0.071***	0.022	-0.073***	0.022	-0.073***	0.022
Satisfaction			-0.010	0.023	-0.021	0.023	-0.021	0.023	-0.022	0.023
Collection site level										
Aggregate satisfaction					0.344**	0.143	0.288***	0.142	0.250	0.144
Opening hours					0.092***	0.021	-0.032	0.040	-0.032	0.040
Collection site type (mobile)							-0.482***	0.138	-0.485***	0.138
Cross-level interactions										
Number of donations*aggregate satisfaction										
Random part										
Variance (intercept)		0.119***		0.131***		0.110***		0.098***		0.098***
Variance (number donations)				0.023		0.023		0.021		0.021
Covariance										
										0.000
										0.000

\*  $P < 0.05$  \*\*  $P < 0.01$ . \*\*\*  $P < 0.001$ .  $n_i = 11$  889 donors  $n_j = 257$  collection sites.

show up after an invitation compared to less experienced and younger donors. Higher educated individuals had higher likelihoods of not showing after an invitation to donate. Contrary to our expectation of a negative influence of deferral on show behaviour (H1b), deferral positively associated with donor return. Attitudes towards donation too associated significantly with show behaviour. Donors higher on warm glow, higher self-efficacy, more donor identity and trust had higher chances of showing after an invitation to donate. Hypothesis 2 was confirmed. Interestingly, benevolence negatively associated with odds of showing up after invitation in the multivariable models. Note, however, that this effect was driven by the other individual level predictors. In a univariate multilevel regression, the effect of benevolence was positive, that is donors scoring higher on benevolence were more likely to show for a subsequent donation.

In Model 3, the aggregated satisfaction with the blood bank/collection site, opening hours and type of collection site were added to the model. Given the effects of the other predictors, higher odds for showing after invitation were found for donors enrolled to fixed collection sites, more extensive opening hours and sites with higher aggregate satisfaction scores. This result confirms our third hypothesis. Importantly, adding level 2 predictors to the model decreased the variation in individual show behaviour by 25%, from .131 to .098 (cf. random part of the table compared between models 2 and 3). This implies an important role for collection site factors in explaining individual donor show behaviour and also points to possible areas for intervention.

Random slopes of the individual level predictors were added to the equation (results not shown) and provided significant results for gender, education, number of donations, earlier deferral, affective attitude, self-efficacy, donor identity, trust and benevolence. To test whether these significant random effects could be explained by different levels of aggregate satisfaction and type of collection site, we stepwise included cross-level interactions between the individual and collection site predictors into the model (see Model 4). One of the interactions turned out significant: between number of donations and aggregate satisfaction. Probing the interaction between previous number of donation and aggregate satisfaction revealed that show behaviour hardly differs for those with higher and lower numbers of previous donation when donating at sites scoring high on satisfaction. On the contrary, donors donating at collection sites scoring low on aggregate satisfaction showed more likely when they had higher numbers of previous donations.

## Discussion

The aim of this study was to examine individual and blood collection site-related determinants of donor show behaviour after having received an invitation to donate. We examined whether show behaviour varied across the different collection sites and whether characteristics of the site could reduce this variation. As our results have shown, considerable variation exists with regard to show behaviour. Most importantly, this study with its multi-level design showed that certain individual factors are consistently associated with donor behaviour and seem to be universal correlates of donor show behaviour. Several of the results were in line with our hypotheses and point to the importance of individual factors in explaining donor behaviour. On top, our study indicates that collection site characteristics, both as subjectively perceived by the donors as well as objective characteristics of type of site, influence individual donor behaviour. Our study is one of the few studies to apply a statistical sound and adequate procedure, that is multilevel modelling, to account for predictor effects on different levels of analysis. Below, we more fully discuss our results and strengths and limitations of the current study.

Two results relating individual factors to donor show behaviour are at first sight counter-intuitive and not easy to explain. Having been deferred before predicted higher show rates whereas higher values on benevolence predicted lower odds of showing, despite a small positive correlation. Part of the explanation of these effects might be due to the fact that the majority of our donors are loyal repeat donors. Altruism, including, benevolence, (reluctant) altruism and warm glow is a complex construct with different dimensions being thought to be important at different stages of one's donor career. At later stages of the donor career, motivation to show for a subsequent donation may be driven more by factors such as donor identity [19]. Similarly, the positive effect of earlier deferral on show behaviour may result from a certain commitment and binding repeat donors have with the blood bank and encourage them even more to show for a subsequent donation, whereas deferral has been shown to discourage show behaviour among first time donors [2].

What has been new in this study is the nested approach. No studies thus far have accounted for the dependency of observations of individual donor behaviour within collection site. Donors are affiliated with a specific collection site, usually situated nearby their work or home. These collection sites differ, among others, in their geographic location, their opening hours and whether they are mobile or fixed. Three specific factors, accounting for characteristics of the collection site, have

been included in this study, providing the strongest results in this study. Higher aggregate satisfaction with treatment at the collection site and the type of collection site, that is fixed, associated with higher self-reported show behaviour. Opening hours only provided significant results in a model without type of site probably because the correlation between these two collection site variables is very high. This might be due to the unique situation in the Netherlands, a densely populated country with rather short distances between towns, a quite high number of fixed collection sites with generous opening hours, often several days a week, exist where the majority of donations is collected. Donors may feel binding with 'their' fixed site in terms of location, environment and staff, increasing their show intentions and behaviour.

These results are informative in two ways. They point to the mere importance of collection site factors in determining blood donor (show) behaviour and provide input and implications for possible policy changes regarding characteristics of collection sites. Satisfaction with the blood bank and collection site regarding friendliness of the personnel, professional treatment by the staff and waiting times may be improved based on the subjective rating of donors who donate at these collection sites.

In sum, the totality of data suggests that a combination of individual factors and collection site characteristics, for example aggregate donor satisfaction, plays an important role in explaining donor show behaviour. Collection site factors were able to explain one-third of the variation in individual show behaviour. Such factors can present clues for blood bank policies and interventions to improve donor attendance.

These strengths noted the current study is not without limitations. Our outcome measure was self-reported and might not be correctly recalled by the donors. Still, we

are convinced of the validity of this measure for two reasons. First, comparing the self-reported measure with 'real' show rates revealed an underestimation instead of an overestimation of show behaviour by donors. Second, other studies too show good results for similarity of subjective recall of individual behaviour and objective measures [26, 27]. Another limitation of the current study is its cross-sectional design. Based on our literature review and hypotheses, we argued that certain individual and contextual factors predict donor behaviour but the reverse might also be possible. Hence, future research might consider other collection site factors, such as geographical situation in order to explain variation in donor behaviour, rely on register data for more objective measures of donor behaviour and apply a longitudinal design.

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## Conflict of interest

The authors declare no conflict of interests.

## Disclaimers

None.

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## Appendix 1 Overview of statements rated to indicate self-efficacy, donor identity, pro-social value orientation and satisfaction with the blood bank

Respondents indicate the extent to which they agree or disagree with the following statements? 1 = totally disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = totally agree

The following seven statements loaded on one component and were labelled self-efficacy.

1. I plan to continue giving blood as long as my health allows it.
2. I consider myself able to continue to give blood as long as my health allows it.
3. I will remain a blood donor until I am no longer allowed to donate.
4. If I receive a reminder or have an appointment to give blood, it goes without saying that I will go.
5. If I wanted to
6. If I receive a reminder or have an appointment to give blood
7. I would be disappointed if I could not give blood anymore.
8. I find it quite difficult to keep giving blood/plasma.\*

The following five statements loaded on one component and were labelled donor identity.

9. I would feel guilty if I did not give blood.
10. Not giving blood is actually against my principles.
11. Being a blood/plasma donor is an important part of who I am.
12. I feel a moral obligation to give blood/plasma.
13. Being a blood donor means more to me than just giving blood.
14. My partner thinks that I should continue to give blood/plasma as long as my health allows it.\*
15. My family and friends think that I should continue to give blood as long as my health allows it.\*

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**Appendix 1** (Continued)

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The following two statements loaded on one component and were labelled trust.

16. In general, most people can be trusted.  
17. You cannot be careful enough when you are dealing with other people.

The following five statements loaded on one component and were labelled benevolence.

18. I prefer to work towards my own wellbeing than towards the wellbeing of others.  
19. I try to work towards the wellbeing of society.  
20. I am not very interested in helping others.  
21. It is important to me that I help others.  
22. I think it is important to help the poor and the needy.

The following four statements loaded on one component and were labelled satisfaction.

23. I think the blood bank is a professional organization.  
24. There is sufficient opportunity to ask questions at the blood bank.  
25. I am convinced that the blood bank treats my personal information with care.  
26. I am approached personally at the blood bank.  
27. I feel like a number when I give blood.\*
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\*Statements 8 and 27 did not pass the minimum threshold for factor loading of 0.50; items 14 and 15 loaded on a third factor that was not used for further analyses.