

# Easy come, easy go. Retention of blood donors

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## SUMMARY

Retention of blood donors has benefits over recruitment of new blood donors. Retention is defined as preventing donors from lapsing and eventually becoming inactive. This review paper discusses literature on the importance of efforts to retain donors, specifically new donors, since lapsing is most common before the fifth donation. Studies have found that intention to donate, attitudes towards blood donation and self-efficacy (does one feel capable of donating blood) are predictors of blood donation. Feelings of 'warm glow' predict donation behaviour better than altruism. The existing literature further suggests that first time donors can be retained by paying extra attention to adverse events (vasovagal reactions and fatigue). These events could be reduced by drinking water and muscle tension exercises. Feelings of anxiety (in regular donors) and stress can further prevent donors from returning. Planning donations amongst busy lives can help retention, and suggestions are given on which interventions might be helpful.

**Key words:** donor, recruitment, retention.

## RETENTION OF BLOOD DONORS

In order to guarantee a safe and sufficient blood supply, donor management (recruitment and retention of blood donors) remains an important focus for blood supply establishments. However, since research on blood donor motivation has started, in the 1970s, studies have mostly focused on recruitment of new blood donors, whilst retention of blood donors has often been overlooked. This review paper aims to give an overview of the latest research in the field of blood donor retention. This research has been limited, has often been survey-based, and not many interventions to test retention strategies have been reported (see also Godin *et al.*, 2012). This review aims to provide a framework for blood services to guide them in retention efforts, and to give them some direction in setting up interventions for retention (Box 1).

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## RECRUITMENT VERSUS RETENTION

Most blood collection establishments spend more money and effort on recruitment of new donors than on retention of current donors. Unjustifiably so, because retention has several benefits over recruitment. First, studies show that the risk of transfusion-transmitted viral infections (e.g. HIV, Hepatitis B and C) in donor blood is higher in new donors than it is in current donors (Glynn *et al.*, 2000). This is because first-time donors have had longer periods to acquire infections than repeat donors, and they have not been previously screened. In addition, donors on average have a healthier lifestyle than non-donors, and therefore tend to avoid infections (Atsma *et al.*, 2011). Second, the mandatory medical screening every new blood donor goes through in order to test eligibility for blood donation is, for some blood collection establishments, both more costly and more time consuming than the regular medical donor screening. In the Netherlands for example, the estimated costs for recruiting a new donor range from 22 euro's (ambassador recruitment) to 58 euro's ('cold' recruitment), whilst retaining a donor costs a mere 7 euro's per year (Sanquin, unpublished data).

## DONOR RETENTION: DEFINITIONS AND NUMBERS

DOMAINE is a European Union funded project that aims to create a safe and sufficient blood supply, by comparing and recommending good donor management practice. A total of 18 European blood establishments collaborated in the project. One of the aims was to agree on a common 'language', i.e. common definitions, for blood donor management. Donor retention was defined as 'preventing blood donors from lapsing and eventually becoming inactive'. Lapsing donors were defined as 'those who donated at least once within the last 24 months, but not in the last 12 months'. Inactive donors were defined as 'not having donated in the last 24 months' (Veldhuizen *et al.*, 2013). The aim of donor retention programmes is to motivate donors to maintain their donating behaviour regularly, provided they are medically eligible. The DOMAINE project has indicated two performance indicators for successful donor retention. The first is the percentage of regular donors, compared to the percentage of first

**Table 1.** Percentage of regular, first time and inactive donors in 10 countries

Country	Regular donors (%)	First time donors (%)	Inactive donors (%)
1	23	4	68
2	71	29	0
3	19	4	68
4	8	16	57
5	37	6	50
6	89	11	0
7	72	11	0
8	19	31	39
9	19	14	57
10	14	12	62

time donors. A higher percentage of regular donors is preferable to a higher percentage of first time donors. The second is the percentage of inactive or lapsed donors in the database (Folléa *et al.*, 2010). In the DOMAINE survey, approximately 50% of the respondents were able to provide data on the composition of the donor population. This composition in terms of donor types varied considerably between countries (Table 1). Many establishments got most of their donations from donors who made a small number of donations (1–5) in their lifetime (Veldhuizen & Wagenmans, 2010). The difference between the countries in proportion of first time/regular and regular/inactive donors may be due to whether the blood service focusses on recruitment only, or also has a programme for retention of donors.

### RETENTION OF NEW DONORS

Retaining newly recruited donors seems to be a challenging task for blood collection establishments. From all newly recruited and tested donors in the Netherlands, 24.9% do not provide a second donation (Sanquin, eProgesa data, unpublished). A recent study in England and North Wales showed that of new donors in the study population, only 38.4% made a second donation within 6 months, and 52.1% made a second donation within 12 months (Lattimore *et al.*, 2015). In Ohio, only 35% of first and second time donors made a repeat donation attempt within 2 years (France *et al.*, 2013).

Schreiber *et al.* (2005) found that the number of donations that new donors made in their first year predicted long-term retention. The more donors donated in their first year, the more likely it was that they became regular donors. Previous studies have focussed on the theory behind this trend, and have found that after approximately four donations, 'being a blood donor' becomes a 'role identity' (Charng *et al.*, 1988). Donor role identity refers to the match between being a blood donor and the person's self-concept, and is a predictor of future blood donation (Charng *et al.*, 1988; Armitage & Conner, 2001; Giles *et al.*, 2004). Masser *et al.* (2008) identified stages in the donor career

referred to as (1) initiation, (2) maintenance, (3) habit formation, (4) habit, and (5) establishment of blood donor identity formation. Because the motivators and barriers towards donation are different in each stage, each stage requires a different retention strategy. Studies have found that the motivating factors associated with first time donation are different from the factors associated with maintenance of the blood donation behaviour (Callero & Piliavin, 1983). Another study found that donors' self-categorisation indicated a split between non-donors, first-time donors, occasional donors (2–4, median of four donations) and regular donors (five or more donations) (Ferguson & Chandler, 2005). Such research suggests that experiences at the first donation and in the first years of the donor career seem crucial for creating a pool of regular, committed blood donors.

### DETERMINANTS OF RETENTION

Studies on retention of blood donors have found several factors that are associated with continuation of donation behaviour.

#### *Demographics*

Western countries show similar demographic characteristics associated with blood donation. In the Netherlands, lapsed donors were more often female, younger than 24 years, had a lower social economic status (as indicated by the fact that they live in areas with a low mean real estate value and a low mean taxable income), and lived in more urbanised areas (Veldhuizen *et al.*, 2009). In England and North Wales, those living in the capital (London) returned significantly less often to donate blood than those living in other urban areas or rural residents. In addition, return rate increased with increasing age group, men were more likely to return than women, and whites were more likely to return compared with other ethnic groups (Lattimore *et al.*, 2015).

#### *Altruism or benevolence?*

Altruism and pro-social values are often named as motivators for donating blood (Bednall & Bove, 2011). However, many researchers have questioned whether altruism is an actual motivator for behaviour, or a rationalisation of more selfish motives [e.g. donating blood makes donors feel good about themselves (Piliavin, 1990)]. Studies investigating this hypothesis have provided evidence towards more 'egoistic' motives, as beliefs in personal rather than societal benefit predict actual future donation (Ferguson *et al.*, 2008). Other studies found that donating blood was associated with feelings of 'warm glow' (donating blood because it makes one feel good about themselves), and found no evidence that they were motivated by empathic concerns (Ferguson *et al.*, 2012a,b). Therefore, retention campaigns should focus on warm glow rather than on purely altruistic messages.

### The theory of planned behaviour

Especially in the beginning of the donor career, before donating blood becomes a 'habit', donation is mostly under volitional control. This means that donors make a conscious decision to donate or not to donate. Therefore, blood donation research from a behavioural science point of view has often used the theory of planned behaviour (TPB) (Ajzen, 1991) to explain blood donation behaviour. The TPB proposes that behaviour is mostly influenced by the strength of a person's intention to perform that behaviour. Intention in turn is predicted by attitudes, subjective norm and self-efficacy. Attitudes refer to a person's overall evaluation of the behaviour, for example, are the outcomes of the target behaviour (e.g. blood donation) likely to be good or bad (cognitive attitude), pleasant or unpleasant (affective attitude). Subjective norm refers to a person's beliefs concerning significant others' approval or disapproval of the behaviour. Finally, self-efficacy refers to a person's confidence and perceived ability to perform a behaviour successfully. The intention to donate blood has indeed been found to be a consistent predictor of blood donation (Ferguson & Bibby, 2002; Ferguson *et al.*, 2007; Godin *et al.*, 2007; Masser *et al.*, 2008; Van Dongen *et al.*, 2014). Veldhuizen *et al.* (2011) found that during all stages of the donor career self-efficacy was the main predictor of intention to donate. Self-efficacy in itself also predicts donation behaviour (Armitage & Conner, 2001; Giles *et al.*, 2004). Wevers *et al.* (2013) found that affective attitude (whether the donor feels giving blood is pleasant or unpleasant, annoying or enjoyable and unappealing or appealing) was positively associated with higher return behaviour. Anticipated negative emotions, also labelled as anticipated regret (as measured by 'If during the next 6 months I did NOT give blood again ...': '... I would regret it', '... It would bother me', '... I would be disappointed') have also been shown to predict donation behaviour (Godin *et al.*, 2007; Conner *et al.*, 2013), especially in experienced donors.

Persuasive techniques such as modelling and planning coping responses can be effectively used to increase attitudes, self-efficacy and intentions towards blood donation, (France *et al.*, 2010a; France *et al.*, 2011).

### Deferral

Temporary deferral for medical reasons, such as a low haemoglobin level, can also cause donors to lapse (Custer *et al.*, 2007). This effect is especially strong in first-time donors (Custer *et al.*, 2011). However, why temporary deferral has such an impact on donor motivation, and how we can frame deferral messages to decrease lapsing after temporary deferral, has not been studied yet.

### Adverse events

Research has shown that a physical reaction during or after donating blood strongly decreases subsequent donations. Most studies on these adverse events measured vasovagal reactions.

Vasovagal reactions are symptoms such as dizziness and nausea, which are caused by a combination of tension, a drop in blood pressure and the insertion of a needle in the vein. France *et al.* (2004) found that for every 1 point increase on the Blood Donation Reaction Inventory (Meade *et al.*, 1996), the likelihood of return for a subsequent donation decreased by 4%. In 2005, France *et al.* (2005) found that of those donors who did not experience a vasovagal reaction, 64% returned for a next donation within 1 year, whilst amongst donors who experienced light vasovagal reactions, only 40% returned for a next donation. Similarly, Newman *et al.* (2006) found that experiencing a vasovagal reaction decreased return rates by 34%.

Reactions other than vasovagal reactions have not been studied as extensively, but many donors do report feelings of being tired following donation or experiencing needle reactions such as bruising or sore arm. Investigating the effect of specific adverse reactions on return rates, Newman *et al.* (2006) found that bruising had no effect, but fatigue decreased return rates by 20%. Similarly, Van Dongen *et al.* (2013) found that in first time blood donors, fatigue after blood donation had a negative impact on retention, but needle reactions did not influence retention.

### Anxiety and stress

One of the most commonly named barriers, even for regular donors, is anxiety or fear of donating blood (Masser *et al.*, 2008; Bednall & Bove, 2011). Fear can take many forms, such as fear of needles, general nervousness, fear of reduced health after donating, or fear of fainting. Studies have indeed shown that pre-donation anxiety is related to vasovagal reactions (Meade *et al.*, 1996; Ditto & France, 2006; Viar *et al.*, 2010). This could be explained by the fact that anxiety increases needle pain, and needle pain subsequently increases vasovagal reactions (France *et al.*, 2013). In addition, anxiety is a correlate of attitudes towards donation (Clowes & Masser, 2012). Attitude and vasovagal reactions predict donation behaviour, therefore, anxiety can have an indirect effect on retention.

To study the direct effects of fear and anxiety on continuing blood donation, Van Dongen *et al.* (2013) measured fear (of needles) and anxiety (general nervousness, anxiety about feeling faint) in new blood donors who had just signed up. Donors were asked to what extent they were afraid of needles, to what extent they felt nervous and/or tense about blood donation, and to what extent they were afraid of feeling faint or fainting at the blood donation. The same questions were asked after their first donation (1–2 months later). Anxiety increased after the first donation, however, neither the level of increase nor the anxiety scores themselves were associated with subsequent donation (Van Dongen *et al.*, 2013). In a second study, Van Dongen *et al.* (2014) looked at the effect of fear and anxiety on retention in regular donors. Donors who made their first donation 1 year previous were asked the same questions as in the 2012 study. In this group, the scores on fear and anxiety were related to subsequent donations. This is in line with a study by France *et al.*

(2013) who found no effect of anxiety on donation in first time donors, but did find an effect of anxiety on donation in regular donors.

The stress that is related to adverse events decreased retention in first time donors (Van Dongen *et al.*, 2013). Regardless of the severity of the physical reaction, the level of subjective distress experienced by the donor influenced subsequent donations. This indicates that personal coping is important when it comes to dealing with stressful events related to blood donation.

### Planning

Failure of planning donations, the time it takes to donate blood, and lack of reminders have all been named as barriers for retention (Masser *et al.*, 2008; Bednall & Bove, 2011). Donors in a study by Schreiber *et al.* (2006) named 'inconvenience' as the major barrier to donation. Similarly, Nilsson Sojka & Sojka (2003) reported that laziness was the most self-reported obstacle to donating blood regularly.

In a longitudinal study, Van Dongen *et al.* (2014) found that planning failure in donors [as measured by the items ('I have forgotten invitations to donate blood in the past'; 'In general, it is difficult for me to make the time to donate blood'; and 'After receiving an invitation, I have postponed my visit once or twice')] acts as a long term determinant of donation behaviour, by not only negatively affecting the first consecutive donation but also the second and third donations.

## INTERVENTIONS TO IMPROVE RETENTION

In a systematic review of interventions, Godin *et al.* (2012) point out that in over 40 years of research in blood donation behaviour remarkably few studies have focussed on intervention studies. The studies that have been published generally suffer from publication bias, lack of robustness and insufficient reporting of methodology (Godin *et al.*, 2012).

In the following section, interventions to influence changeable determinants mentioned in the previous section are summarised. A lot of these interventions have only been tested once, and often in only one country or in one blood collection establishment. Many have either not made a distinction between donor stages [first-time donors, novice donors (2–4 donations) and experienced donors], or the study group only consisted of donors in one of these stages. Therefore, these results should be interpreted with care.

### Adverse events

Contrary to other blood donation determinants, detailed interventions to prevent vasovagal reactions have been developed to reduce or prevent adverse events. Applied muscle tension and water loading are interventions that can prevent vasovagal reactions (i.e. Ditto & France, 2006; Ditto *et al.*, 2007; France *et al.*, 2010b; Wieling *et al.*, 2011). An intervention combining

findings from behavioural science and social science that could help prevent vasovagal reactions, and thus increase retention, is combining applied muscle tension with implementation intentions to maintain these exercises at every blood donation (Ferguson *et al.*, 2007). Implementation intentions are if-then plans ('If situation X arises, then I will initiate the goal-directed response Y'), aimed at translating intentions into behaviour (Gollwitzer, 1999). Instructing donors to repeat the proposition 'If I am in the donation chair, then I will immediately start using applied muscle tension techniques' can help them to translate their intended vasovagal reaction prevention techniques into behaviour.

### Anxiety and stress

Stress reduction techniques could yield positive results. Hanson & France (2009) found that, compared with standard donation controls, donors receiving social support during blood donation reported fewer pre-faint reactions and greater likelihood of donating again within the next year. Social support does not necessarily have to be provided by a person known to the donor, as this experiment used research assistants providing encouragement, and distraction in the form of small talk. Another study found that phlebotomists' social skills reduce donor reactions (Stewart *et al.*, 2006). These interventions may be most effective when targeted on those donors that experience high subjective distress. Coping strategies could also incorporate passive distraction, for example getting the donor to read a book or magazine, or making tablets available. Another strategy could be to get the donor to reappraise their negative emotion (anxiety, stress), by emphasising that the negative event has a positive outcome (Webb *et al.*, 2012). This could be combined with the studies by Ferguson *et al.* on 'warm glow' (e.g. donating blood because it makes one feel good). If donors can be motivated to reappraise their feelings of fear, anxiety and distress by emphasizing that they may feel a bit bad now, but they are actually saving a life and therefore should feel proud and good about themselves, less donors may be lost to negative emotions associated with blood donation. Such strategies would require further study and/or controlled trials to ensure that the outcome for the donors and their continued donation in these circumstances is indeed beneficial.

### Planning

Ferguson *et al.* (2007) and Masser *et al.* (2008) suggest interventions that make blood donation a completely planned action sequence, including inviting the donor to make an appointment, sending them reminders and contacting them if they fail to keep a donation appointment. In a systematic review of the literature on interventions promoting blood donation, Godin *et al.* (2012) found a small-to-medium effect size of reminders ( $d = 0.36$  across seven studies) on blood donation retention. In addition, action planning interventions such as the aforementioned implementation intentions could also be

used to overcome barriers related to planning, or perceived inconvenience. Implementation intentions have proven to be effective in other areas besides blood donation (for an overview, see Gollwitzer & Sheeran, 2006). Wevers *et al.* (2015) tested the use of implementation intentions on retention in new blood donors. Every newly registered donor received an information sheet with the following propositions: 'If I receive the invitation card, then I will schedule a date and time in my agenda to donate blood on (opening hours of the blood bank)' and 'If I'm not able to donate blood within two weeks, then I will cancel my donation in the following way (answer options: e-mail, telephone call or via the blood bank website)'. Donors were asked to fill out these propositions. In addition, donors were asked to sign the following commitment statement: 'I have understood the above information and I have the intention to give blood. I realize that the blood bank is counting on me when I am invited to donate blood'. Donors who filled out both the implementation intention propositions and the commitment statement had an 11.5% higher return rate than donors in the control condition. Such interventions can easily be translated to a blood collection setting without an invitation system, by changing the proposition to 'If I see a call for a blood drive in my (city/university/neighbourhood), then I will schedule a date and time in my agenda to donate blood'.

The same technique worked for temporarily deferred new donors in a study by Godin *et al.* (2013). These donors completed if – then plans that specified how three potential obstacles to donating blood (forgetting to attend, fitting the opportunity to give blood into one's schedule, and organizing transportation to the donation venue) could be overcome. Participants were instructed to read the coping plans three times, and to tick a box when they were able to say the entire statement to themselves without reading it. The plans were: 'If the blood bank phones me about a nearby blood drive, then (1) I will write down the time, day and location of the blood drive in my diary or calendar; (2) I will think creatively about how I will fit giving blood into my schedule!, and (3) I will \_\_\_\_\_ [please write in your plan about how you will travel to the blood donation center]'. Temporarily deferred donors who formed the implementation intentions had a 19% greater chance of returning to give blood again compared with the control condition.

However, because blood donation is essentially a volunteer activity, planning interventions should be designed with caution. Previous research has implicated that too much perceived 'pressure to donate' (as measured by the items 'I prefer to be invited by the blood bank less often for a blood donation' and 'The blood bank makes an appeal on me more often than I would like to') can have counteractive effects on retention (Wevers *et al.*, 2013). Removing perceived pressure to donate by adding a text such as 'We understand that it is not always easy to make time for donating blood. That's why we really appreciate it if you make the effort to donate.' has shown to increase show rate to invitations in a preliminary study (Boeschen Hospers *et al.*, 2013).

### BOX 1: What is known about retention?

Extra effort is needed to retain new donors  
 First time donors can be retained by reducing adverse events and fatigue  
 Feelings of stress and anxiety can decrease retention  
 Donors can be retained by helping them plan their donation and act on their plans

### BOX 2: What are the areas for future research?

How can planning techniques be tailored to different settings and to different donor groups?  
 How can we refine and improve existing retention techniques?  
 Which other factors determine donor retention?  
 How can we reduce stress and anxiety in donors?  
 How do we motivate temporarily deferred donors to return?

## CONCLUSION AND FUTURE RESEARCH

To summarize, research has found several indications for good donor retention strategies. First, retention of new donors should start from recruitment onwards, because lapsing mostly occurs in first time donors, and habit formation only starts around the fourth donation. Donors most at-risk for lapsing are younger, female and live in urban areas. Donors claim they are motivated by altruism, but studies show that the feeling of warm glow is a better predictor of actual behaviour. This feeling should therefore be nursed and stimulated. Retention materials should encourage new donors confidence in their ability to donate blood, especially when they get temporarily deferred. Making the donation a pleasant experience, and reminding donors that they might be disappointed in themselves if they do not donate could further motivate retention. Donors, and especially first-time donors, need to be strongly monitored for vasovagal reactions, fatigue and levels of stress related to adverse events. Encouraging them to drink water and apply muscle tension, and make anxiety and stress-reducing techniques available, will help decreasing vasovagal reactions. Finally, helping donors to plan their donation by making appointments and sending reminders could have long term effects to increase donor retention (Box 2).

Future studies could contribute to reduced lapsing of blood donors by focusing on the design and evaluation of methods of helping motivated donors prioritise donation amid busy daily lives. The key factor in these interventions should be helping people to act on their donation intentions. Several behaviour change techniques are available to promote action planning and decrease planning failures (Abraham & Michie, 2008; Sniehotta,

2009; Abraham, 2012). Studies on commitment and consistency could add to these techniques (e.g. Cialdini, 2009). Existing literature on action planning and coping planning can help set up experiments to unravel which technique would work best for blood donors. Because a personality trait like conscientiousness could be associated with planning failure (Conner & Abraham, 2001; Ferguson, 2004), future interventions might be tailored to donors with low conscientiousness.

Another line of research could be designing interventions to reduce stress and anxiety, by helping donors cope better with the donation experience and potential adverse events. Because fatigue as a donor reaction, as opposed to vasovagal reactions, has not been studied yet, studies into the cause and prevention of, and coping with, fatigue are warranted. Future studies on temporary deferral could focus on why temporary deferral has such

an impact on donor motivation, and how we can frame deferral messages to decrease lapsing after temporary deferral. Intervention Mapping (Bartholomew *et al.*, 2011), a planning process for the systematic theory- and evidence-based development of interventions can be very useful in developing and tailoring such retention materials.

## CONFLICT OF INTEREST

The author has no competing interests.

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## REFERENCES

- Abraham, C. (2012) Mapping change mechanisms and behaviour change techniques: a systematic approach to promoting behaviour change through text. In: *Writing Health Communication: An Evidence-Based Guide* (eds Abraham, C. & Kools, M.), 83–89. SAGE Publications Ltd., London.
- Abraham, C. & Michie, S. (2008) A taxonomy of behavior change techniques used in interventions. *Health Psychology*, **27**, 379–387.
- Ajzen, I. (1991) The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, **50**, 179–211.
- Armitage, C.J. & Conner, M. (2001) Social cognitive determinants of blood donation. *Journal of Applied Social Psychology*, **31**, 1431–1457.
- Atsma, F., Veldhuizen, I.J.T., de, Vegt, F., Doggen, C.J.M. & De Kort, W.L.A.M. (2011) Cardiovascular and demographic characteristics of whole blood and plasma donors: results from the Donor InSight study. *Transfusion*, **51**, 412–420.
- Bartholomew, L.K., Parcel, G.S., Kok, G., Gottlieb, N.H. & Fernandez, M.E. (2011) *Planning Health Promotion Programs: An Intervention Mapping Approach* (3rd edn). Jossey-Bass, San Francisco, California.
- Bednall, T.C. & Bove, L.L. (2011) Donating blood: a meta-analytic review of self-reported motivators and deterrents. *Transfusion Medicine Reviews*, **25**, 317–334.
- Boesch-Hospers, M., Van Geresteijn, E., Peperkamp, C., & Stijnen, E. (2013). *Regelmatig doneren kun je leren! Het verhogen van het opkomstpercentage van volbloeddonors*. Unpublished Master's thesis, Radboud University, Nijmegen.
- Callero, P.L. & Piliavin, J.A. (1983) Developing a commitment to blood donation: the impact of one's first experience. *Journal of Applied Social Psychology*, **13**, 1–16.
- Charng, H., Piliavin, J.A. & Callero, P.L. (1988) Role identity and reasoned action in the prediction of repeated behavior. *Social Psychology Quarterly*, **51**, 303–317.
- Cialdini, R.B. (2009) *Influence: Science and Practice*. Pearson Education, Boston, Massachusetts.
- Clowes, R. & Masser, B.M. (2012) Right here, right now: the impact of the blood donation context on anxiety, attitudes, subjective norms, self-efficacy, and intention to donate blood. *Transfusion*, **52**, 1560–1565.
- Conner, M. & Abraham, C. (2001) Conscientiousness and the theory of planned behaviour: toward a more complete model of the antecedents of intentions and behaviour. *Personality and Social Psychology Bulletin*, **27**, 1547–1561.
- Conner, M., Godin, G., Sheeran, P. & Gervais, M. (2013) Some feelings are more important: cognitive attitudes, affective attitudes, anticipated affect, and blood donation. *Health Psychology*, **32**, 264–272.
- Custer, B., Chinn, A., Hirschler, N.V., Busch, M.P. & Murphy, E.L. (2007) The consequences of temporary deferral on future whole blood donation. *Transfusion*, **47**, 1514–1523.
- Custer, B., Schlumpf, K.S., Wright, D., Simon, T.L., Wilkinson, S. & Ness, P.M. (2011) Donor return after temporary deferral. *Transfusion*, **51**, 1188–1196.
- Ditto, B. & France, C.R. (2006) Vasovagal symptoms mediate the relationship between predonation anxiety and subsequent blood donation in female volunteers. *Transfusion*, **46**, 1006–1010.
- Ditto, B., France, C.R., Albert, M. & Byrne, N. (2007) Dismantling applied tension: Mechanisms of a treatment to reduce blood donation-related symptoms. *Transfusion*, **47**, 2217–2222.
- Ferguson, E. (2004) Conscientiousness, emotional stability, perceived control and the frequency, recency, rate and years of blood donor behaviour. *British Journal of Health Psychology*, **9**, 293–314.
- Ferguson, E. & Bibby, P.A. (2002) Predicting future blood donor returns: past behavior, intentions, and observer effects. *Health Psychology*, **21**, 513–518.
- Ferguson, E. & Chandler, S. (2005) A stage model of blood donor behaviour: assessing volunteer behaviour. *Journal of Health Psychology*, **10**, 359–372.
- Ferguson, E., France, C.R., Abraham, C., Ditto, B. & Sheeran, P. (2007) Improving blood donor recruitment and retention: integrating theoretical advances from social and behavioral science research agendas. *Transfusion*, **47**, 1999–2010.
- Ferguson, E., Farrell, K. & Lawrence, C. (2008) Blood donation is an act of benevolence rather than altruism. *Health Psychology*, **27**, 327–336.
- Ferguson, E., Atsma, F., de, K.W. & Veldhuizen, I. (2012a) Exploring the pattern of blood donor beliefs in first-time, novice, and experienced donors: differentiating reluctant altruism, pure altruism, impure altruism, and warm glow. *Transfusion*, **52**, 343–355.
- Ferguson, E., Taylor, M., Keatley, D., Flynn, N. & Lawrence, C. (2012b) Blood donors' helping behavior is driven by warm glow: more evidence for the blood donor benevolence hypothesis. *Transfusion*, **52**, 2189–2200.
- Folléa, G., Veldhuizen, I.J.T., Redpath, G., Jarnig, M. & Kral, M. (2010) Donor retention. In: *Donor Management Manual* (eds

- De Kort, W. & Veldhuizen, I.), 103–122. Domane, Nijmegen, the Netherlands
- France, C.R., France, J.L., Roussos, M. & Ditto, B. (2004) Mild reactions to blood donation predict a decreased likelihood of donor return. *Transfusion and Apheresis Science*, **30**, 17–22.
- France, C.R., Rader, A. & Carlson, B. (2005) Donors who react may not come back: analysis of repeat donation as a function of phlebotomist ratings of vasovagal reactions. *Transfusion and Apheresis Science*, **33**, 99–106.
- France, C.R., France, J.L., Kowalsky, J.M. & Cornett, T.L. (2010a) Education in donation coping strategies encourages individuals to give blood: further evaluation of a donor recruitment brochure. *Transfusion*, **50**, 85–91.
- France, C.R., Ditto, B., Wissel, M.E. *et al.* (2010b) Predonation hydration and applied muscle tension combine to reduce presyncopal reactions to blood donation. *Transfusion*, **50**, 1257–1264.
- France, C.R., France, J.L., Wissel, M.E., Kowalsky, J.M., Bolinger, E.M. & Huckins, J.L. (2011) Enhancing blood donation intentions using multimedia donor education materials. *Transfusion*, **51**, 1796–1801.
- France, C.R., France, J.L., Wissel, M.E., Ditto, B., Dickert, T. & Himawan, L.K. (2013) Donor anxiety, needle pain, and syncopal reactions combine to determine retention: a path analysis of two-year donor return data. *Transfusion*, **53**, 1992–2000.
- Giles, M., McClenahan, C., Cairns, E. & Mallet, J. (2004) An application of the Theory of Planned Behaviour to blood donation: the importance of self-efficacy. *Health Education Research*, **19**, 380–391.
- Glynn, S.A., Kleinman, S.H., Schreiber, G.B. *et al.* (2000) Trends in incidence and prevalence of major transfusion-transmissible viral infections in US blood donors, 1991 to 1996. *JAMA*, **284**, 229–235.
- Godin, G., Conner, M., Sheeran, P., Belanger-Gravel, A. & Germain, M. (2007) Determinants of repeated blood donation among new and experienced blood donors. *Transfusion*, **47**, 1607–1615.
- Godin, G., Vézina-Im, L., Bélanger-Gravel, A. & Amireault, S. (2012) Efficacy of interventions promoting blood donation: a systematic review. *Transfusion Medicine Reviews*, **26**, 224–237.
- Godin, G., Amireault, S., Vézina-Im, L.-A., Sheeran, P., Conner, M., Germain, M. & Delage, G. (2013) Implementation intentions intervention among temporarily deferred novice blood donors. *Transfusion*, **53**, 1653–1660.
- Gollwitzer, P.M. (1999) Implementation intentions: strong effects of simple plans. *American Psychologist*, **54**, 493–503.
- Gollwitzer, P.M. & Sheeran, P. (2006) Implementation intentions and goal achievement: a meta-analysis of effects and processes. *Advances in Experimental Social Psychology*, **38**, 249–268.
- Hanson, S.A. & France, C.R. (2009) Social support attenuates presyncopal reactions to blood donation. *Transfusion*, **49**, 843–850.
- Lattimore, S., Wickenden, C. & Brailsford, S.R. (2015) Blood donors in England and North Wales: demography and patterns of donation. *Transfusion*, **55**, 91–99.
- Masser, B.M., White, K.M., Hyde, M.K. & Terry, D.J. (2008) The psychology of blood donation: current research and future directions. *Transfusion Medicine Reviews*, **22**, 215–233.
- Meade, M.A., France, C.R. & Peterson, L.M. (1996) Predicting vasovagal reactions in volunteer blood donors. *The Journal of Psychosomatic Research*, **40**, 495–501.
- Newman, B.H., Newman, D.T., Ahmad, R. & Roth, A.J. (2006) The effect of whole-blood donor adverse events on blood donor return rates. *Transfusion*, **46**, 1374–1379.
- Nilsson Sojka, B. & Sojka, P. (2003) The blood-donation experience: perceived physical, psychological and social impact of blood donation on the donor. *Vox Sanguinis*, **84**, 120–128.
- Piliavin, J. A. (1990). Why do they give the gift of life? A review of research on blood donors since 1977. *Transfusion*, **30**, 444–459.
- Schreiber, G.B., Sharma, U.K., Wright, D.J. *et al.* (2005) First year donation patterns predict long-term commitment for first-time donors. *Vox Sanguinis*, **88**, 114–121.
- Schreiber, G.B., Schlumpf, K.S., Glynn, S.A. *et al.* (2006) Convenience, the bane of our existence, and other barriers to donating. *Transfusion*, **46**, 545–553.
- Sniehotta, F.F. (2009) Towards a theory of intentional behaviour change: plans, planning, and self-regulation. *British Journal of Health Psychology*, **14**, 261–273.
- Stewart, K.R., France, C.R., Rader, A.W. & Stewart, J.C. (2006) Phlebotomist interpersonal skill predicts a reduction in reactions among volunteer blood donors. *Transfusion*, **46**, 1394–1401.
- van Dongen, A., Abraham, C., Ruiters, R.A. & Veldhuizen, I.J. (2013) The influence of adverse reactions, subjective distress, and anxiety on retention of first-time blood donors. *Transfusion*, **53**, 337–343.
- van Dongen, A., Ruiters, R.A., Abraham, C. & Veldhuizen, I.J.T. (2014) Predicting blood donation maintenance: the importance of planning future donations. *Transfusion*, **54**, 821–827.
- Veldhuizen, I. & Wagenmans, E. (2010) Domane survey on donor management in Europe. In: *Donor Management Manual* (eds DeKort, W. & Veldhuizen, I.), 21–30. DOMAINE, Nijmegen, the Netherlands.
- Veldhuizen, I.J.T., Doggen, C.J.M., Atsma, F. & De Kort, W.L.A.M. (2009) Donor profiles: demographic factors and their influence on the donor career. *Vox Sanguinis*, **97**, 129–138.
- Veldhuizen, I., Ferguson, E., DeKort, W., Donders, R. & Atsma, F. (2011) Exploring the dynamics of the theory of planned behavior in the context of blood donation: does donation experience make a difference? *Transfusion*, **51**, 2425–2437.
- Veldhuizen, I., Follea, G. & de Kort, W. (2013) Donor cycle and donor segmentation: new tools for improving blood donor management. *Vox Sanguinis*, **105**, 28–37.
- Viar, M.A., Etzel, E.N., Ciesielski, B.G. & Olatunji, B.O. (2010) Disgust, anxiety, and vasovagal syncope sensations: a comparison of injection-fearful and nonfearful blood donors. *Journal of Anxiety Disorders*, **24**, 941–945.
- Webb, T.L., Miles, E. & Sheeran, P. (2012) Dealing with feeling: a meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological Bulletin*, **138**, 775–808.
- Wevers, A., Wigboldus, D. H., van Baaren, R. & Veldhuizen, I.J. (2013) Return behavior of occasional and multigallon blood donors: the role of theory of planned behavior, self-identity, and organizational variables. *Transfusion*, **54**, 805–813.
- Wevers, A., Wigboldus, D.H.J., van den Hurk, K., van, Baaren, R. & Veldhuizen, I.J.T. (2015) Increasing first-time blood donation of newly registered donors using implementation intentions and explicit commitment techniques. *Vox Sanguinis*, **108**, 18–26.
- Wieling, W., France, C.R., Dijk, N., Kamel, H., Thijs, R.D. & Tomasulo, P. (2011) Physiologic strategies to prevent fainting responses during or after whole blood donation. *Transfusion*, **51**, 2727–2738.