Improving first-time donor attendance rates through the use of enhanced donor preparation materials

Barbara Masser,1,2 Christopher R. France,3 Jayne Foot,4 Amy Rozsa,4 Jane Hayman,5 Daniel Waller,6 and Everard Hunder4

BACKGROUND: Many nondonors are positive about blood donation and this motivates booking an appointment to donate. However, as their appointment approaches barriers to donating—such as anxiety—may become salient and deter attendance. Building on research of France and colleagues demonstrating the positive effect of enhanced preparation materials on donor recruitment, this study sought to determine whether these materials could effectively boost first donation appointment attendance.

STUDY DESIGN AND METHODS: A field study comprising a 3 (brochure: none, e-mail, hard copy) × 2 (national call center [NCC] contact: none, call) between-subjects design was conducted with 3646 nondonors who had scheduled their first appointment. Participants in the brochure conditions received either a hard copy or an e-mailed link to electronic materials modeled on the donor preparation research of France and colleagues. Participants in the NCC call condition also received a call scripted in line with these preparation materials. The key outcome was new donor attendance rate.

RESULTS: Although first-appointment attendance rates were high in the control (no additional contact) condition at 85.07% of those not canceling in advance, dual exposure to the preparation materials through a NCC call and an electronic brochure boosted attendance. The relative risk of attending in the NCC call and electronic brochure condition was 1.0836 (95% confidence interval, 1.0352-1.1343; p = 0.0006), with attendance 8.36% higher than in the control. This gain in attendance came at a relative increase in recruitment costs of 2%.

CONCLUSION: The use of tailored communication to address new donors’ concerns and prepare them for donating bolsters attendance rates.

ABBREVIATIONS: AE(s) = adverse event(s); NCC = national call center; RR = relative risk.

From the 1School of Psychology, University of Queensland, St Lucia, QLD, Australia; the 2Research & Development, Australian Red Cross Blood Service, Brisbane, QLD, Australia; the 3Department of Psychology, Ohio University, Athens, Ohio; the 4National Marketing, Australian Red Cross Blood Service, Melbourne, VIC, Australia; the 5School of Psychological Sciences, Monash University, Melbourne, VIC, Australia; and the 6Clinical Services and Research, Australian Red Cross Blood Service, Melbourne, VIC, Australia.

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Address reprint requests to: Barbara Masser, School of Psychology, McElwain Building, The University of Queensland, St Lucia, QLD 4072, Australia; e-mail: b.masser@psy.uq.edu.au.

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38% of US donors who received a reminder call did not attend. In Australia, more than 18% of first-time donors do not attend their appointments and fail to cancel in advance. Given the effort involved in making an appointment, and the motivation that led the would-be donor to this point, this figure is surprising. Why would a prospective donor not attend an appointment he/she made?

For the minority, making an appointment to donate might not be wholly voluntary. Group recruitment drives may result in some nondonors acquiescing to social pressure. However, attrition between appointment and attendance also occurs with those who feel no social pressure. Theoretically, this attrition can be conceptualized as a failure to move between the preparation and action stages identified in the transtheoretical model of behavioral change. Nondonors who make appointments are in the preparation stage as they intend to take action in the next short time period. Nondonors who successfully achieve a desired behavior (i.e., attend) are in the action stage. As noted by Ferguson and others, transition between stages is not automatic and often stage specific interventions are needed.

In the context of blood donation, Ferguson and Amoyal and colleagues identify key factors for moving nondonors from preparation to action. Ferguson highlights the importance of commitment and a structured environment, while Amoyal and colleagues emphasize being willing donors talking to others about their intention to donate and countering any fear of donation. This suggests that the transition of nondonors from preparation to action should be assisted by a physical or psychological structure to their donation (i.e., an explicit script for what to expect when they present to donate) and the opportunity to discuss their thoughts and feelings about their upcoming donation.

Anxiety may also be an underestimated influence on behavior as the opportunity to donate approaches. For most, the initial decision to donate is a rational one and cognitions account for a substantial amount of variance in nondonors’ and donors’ intentions and behavior. However, an intention-behavior gap has been observed for blood donors and nondonors' intentions and behavior. How do we account for a substantial amount of variance in donors talking with others about their intention to donate and countering any fear of donation? This suggests that the transition of nondonors from preparation to action is assisted by a physical or psychological structure to their donation (i.e., an explicit script for what to expect when they present to donate) and the opportunity to discuss their thoughts and feelings about their upcoming donation.

From appointment to presentation
France and colleagues have repeatedly demonstrated the benefits of working with prospective donors to structure their anticipated experience, reduce their anxiety, and bolster their sense of being able to cope with donating (i.e., self-efficacy). For example, in a study sampling both nondonors and donors, specially designed enhanced donor preparation brochures resulted in a more positive orientation (more positive attitudes, less anxiety, increased self-efficacy, stronger intention to donate) compared to both a standard blood service brochure and a non-blood donation control brochure. The enhanced preparation brochure comprised information on the script of blood donation, information to address common donor concerns about fear, pain, and potential vasovagal reactions and empirically validated coping strategies for AEs. The beneficial effects of enhanced preparation materials have now been replicated with samples of nondonors, in different countries (e.g., Australia), and when administered through different channels (e.g., video or web).

Critically, changes in intention as a result of the enhanced materials translate through to behavior. In an evaluation with both donors and nondonors, France and colleagues replicated the positive effects of the enhanced preparation brochure on attitudes, anxiety, self-efficacy, and intention. In addition, those who received the enhanced preparation materials were significantly more likely to sign up for a blood drive than those in the control conditions, with this effect on behavior driven by improvements to participants’ self-efficacy.

Enhanced preparation materials give would-be donors a script for donating, bolster their confidence in their ability to donate, and diminishes anxiety about blood donation. This information is beneficial for those already positively disposed toward donating and may be particularly useful when anxiety is beginning to overwhelm rational thoughts about donating. Consistent with the processes of change in the transtheoretical model, this suggests that enhanced preparation materials may increase the number of first-time donors who attend appointments.

Enhanced reminders
A challenge, however, is how to best and most cost-effectively deliver this information. Previous evaluations have used hard copy brochures and video and Web presentations—all of which may be prohibitively costly for routine use. Cheaper modes, already routinely used by BCAs, are e-mails and telephone calls. While e-mails may be less effective at engaging (potential) donors than phone calls (because of saturation and the need for the e-mail to be opened to provide exposure to the content), mere recognition of the sender as the BCA may prime behavior. This reminder effect may be further enhanced when it occurs through multiple mediums (e.g., phone and e-mail). Germain and Godin found that pairing reminder e-mails with phone calls...
significantly improved blood drive attendance for experienced male donors in comparison to reminders administered via a single modality.

Aside from the reminder function of phone calls and e-mails, tailoring the message contained has also yielded beneficial effects. In a randomized trial, Reich and colleagues assessed the impact on first-time donor retention of varying the medium of communication (phone or e-mail), message communicated (empathy/altruism or donor-focused message), and offer of an incentive after their next donation (T-shirt or none). While the empathy/altruism message outperformed the donor-focused message, there was no effect of incentive and e-mail appeared significantly less effective in promoting retention than phone calls. However, in this study 20% to 30% of e-mails sent failed to be delivered.

Significant effects of message content have also been observed in the limited empirical reports of attempts to increase first-time donor attendance. Lipsitz and colleagues conducted two experiments varying the content of a reminder call to students who had made an appointment to donate. In both experiments, and consistent with a transtheoretical process of change, adding a simple commitment request that was affirmed by the donor to the standard reminder was most effective in increasing attendance.

**This study**

The attendance of first-time donors in Australia is high, but not perfect. Psychologically, at this stage would-be donors are moving from preparation to action and their increasing affective reaction to the reality of donating may hinder translation. France and colleagues conducted two experiments varying the content of a reminder call to students who had made an appointment to donate. In both experiments, and consistent with a transtheoretical process of change, adding a simple commitment request that was affirmed by the donor to the standard reminder was most effective in increasing attendance.

As such, the aim of this study was to evaluate the impact of enhanced preparation materials delivered in either a hard copy or an e-mail brochure format and administered either in the absence or presence of a call from the BCA National Call Center (NCC). The enhanced preparation materials for the brochures and call script were based on the enhanced donor preparation materials of France and colleagues. The control condition was the current practice of the BCA of an appointment and hydration reminder text message that costs $0.04 to send. On the basis of prior research, it was predicted that prospective donors allocated to any of the intervention conditions would present to donate at a significantly higher rate than those in the control condition. Further, and consistent with Germain and Godin, it was predicted that those allocated to the double-contact conditions (brochure and NCC call) would present at a rate significantly greater than those in the single-contact conditions. It was anticipated that in this study the dual-contact conditions may have an additive effect whereby the NCC call may prompt greater engagement with the brochure. No predictions were made with regard to brochure modality. Although prior research found no benefit of e-mail in comparison to phone contact, because e-mail communication has become increasingly normative, its impact may now be equal or superior to traditional surface mail communication.

**MATERIALS AND METHODS**

**Participants and design**

Participants were 3646 nondonors (1269 male, 2377 female) aged 16 to 71 years (mean ± SD, 32.0 ± 12.3 years) who had made their first appointment to donate at a fixed site between July and October 2014. Those sampled into the study had made appointments to donate at least 14 days in advance, and overall appointments were booked a median of 23 days in advance. During the test period those making their first appointment (that were not part of a group booking) were randomly selected for inclusion and were randomly assigned to one of six conditions resulting from the 3 (brochure: none, e-mail, hard copy) × 2 (NCC contact: none, call) between-subjects design.

**Method and measures**

**Brochure conditions**

Participants in the brochure conditions received either a four-page A5-sized brochure hard copy, at a total cost of $12.54 per brochure (to print and post), or an e-mailed electronic brochure (at a total cost of $0.02 to send), approximately 1 week before their appointment. These brochures were modeled on the enhanced preparation materials of France and colleagues. Participants in the hard copy condition received “A Guide for First-time Donors” that was accompanied by a welcome letter that asked them to read the brochure and reminded them of how donated blood products are used. Participants in the electronic brochure condition were sent an e-mail entitled “Welcome: A Guide for Your First Donation.” The landing page of this e-mail confirmed the participant’s appointment details. Both the landing page of the e-mail and welcome page of the hard copy brochure contained text that reassured recipients that it was normal to feel a little nervous before their first donation. Recipients in both conditions were told that the brochures had been designed to ensure that they had a positive and uplifting experience in their donation.

The contents of the hard copy and electronic brochures were identical. Specifically, the brochures comprised sections on overcoming concerns (fear,
nervousness, pain, and physical reactions), how to prepare for donation (sleep, drink, eating, and being well), and what to expect before, during, and after donation. Consistent with the approach of France and colleagues, this section included information on how donors could distract themselves and instructions on how to engage in applied muscle tension\(^{33}\) while donating. The brochures also provided information on the usefulness of donations and what the donor could do if he/she changed his/her mind about donating. For those in the electronic brochure condition, the landing page provided brief information on how to prepare and what to expect with recipients encouraged to click hyperlinks to "read more." These links led to pages that provided the detailed information included in the hard copy brochures. Nondonors recruited into the study but allocated to the no-brochure condition received only the standard reminder text message from the BCA in the period between making their appointment and scheduled attendance.

**NCC contact**

Participants in the NCC contact condition received a call 5 to 6 days before their scheduled appointment, at a total cost of $0.75 per call. The call was scripted to follow a standard format comprising a welcome (thank you for making an appointment, brief information on who donations help, confirming appointment details), a briefing on the donation process (what happens before, during, and after donation), a boost to self-efficacy about donating, and a summary. To bolster self-efficacy, donors were reassured that it was normal to feel nervous before the first donation and that they were able to talk through any concerns they had about donating. The call recipients were then explicitly asked if they had any questions or concerns about their donation that they would like addressed. If concerns relating to fear about donating, physical reactions or pain were identified the script allowed the operator to validate the concerns and suggest ways to overcome or control these situations. This information was consistent with the messaging developed and used in the donor brochures. In the summary segment of the call, appointment details were reiterated and the donor was reminded to sleep, eat, and drink plenty of water before presenting to donate. The call concluded with a reiteration of thanks and a reminder that their upcoming donation would save three lives. On average calls lasted 2.62 minutes (SD, 1.78 min; range, 0.06-15.58 min). Nondonors recruited into the study but allocated to the no-call condition did not receive a call from the NCC between making their appointment and their scheduled appointment.

**Presentation rate**

The presentation rate of all new donors recruited into the study was assessed through national BCA records. A new donor was considered to have presented for donation if they attended a center or mobile unit during the duration of the study. Those who did not present to donate during this time either canceled before their scheduled attendance date or simply did not attend.

**Statistical analysis**

The percentage of donors who presented to donate was calculated on an intention-to-treat basis. These figures were then used to calculate the ratio of proportions (relative risk (RR)), standard error of RR, and the 95% confidence interval (CI) between the different conditions using the formulas provided by Altman\(^{34,35}\) and Daly.\(^{36}\) Bonferroni adjustments for multiple comparisons were made. In these analyses, the RR represents the estimate of the donor presenting to donate in comparison to the control (no intervention) condition.

**RESULTS**

The attendance and cancellation rate of new donors was calculated by condition and is presented in Table 1 in conjunction with intervention cost information (raw cost and cost in comparison to the business as usual practice of sending text reminders). Across conditions, cancellation rates during the period from making the appointment to the scheduled appointment ranged from 18.86% to 22.94%. In many instances, cancellation of the appointment occurred before the distribution of materials and/or NCC call. Although first appointment attendance rates were high in the control condition (66.17% of all donors/85.07% of donors who did not cancel) this figure was only a little higher than previous rates observed by the Blood Service (81.40% in the period immediately before this study). This marginal discrepancy in attendance rates between the control condition and the period prior may have resulted from a general Blood Service awareness campaign in field at the time the study was conducted.

When broken down by contact condition, and with adjustments for multiple comparisons in place, the RR of attending was significant in only one of the enhanced preparation conditions: NCC call and electronic brochure. For new donors in this condition who did not cancel in advance, the RR of attending was 1.0836 (95% CI, 1.0352-1.1343; \(p = 0.0006; \) see Table 2). That is, the attendance rate of donors in the NCC call and electronic brochure condition was 8.36% higher than in the control condition. This gain in attendance came at a relative increase in recruitment costs over costs incurred in the control condition of 2%. Deferral rates did not significantly differ by condition, averaging out at 34.1% of those recruited into the study.

The RR of new donors in the NCC call and electronic brochure condition engaging in predictable behavior—that is, either presenting or notifying the Blood Service by
canceling in advance—was 1.0596 (95% CI, 1.0226-1.0979; p = 0.0014; see Table 3). This indicates a 5.96% higher “predictable behavior” rate in the NCC call and electronic brochure condition versus the control condition. That is, the rate of donors who do not attend is minimized in the NCC call and electronic brochure condition. For many BCAs, donors who do not attend without canceling are the most problematic as the lack of predictability of their behavior results in less optimal use of resources. Specifically, for those who do not cancel, BCAs have to staff and schedule in anticipation of attendance.

### DISCUSSION

Building on research that has shown the beneficial effects of enhanced donor preparation materials in improving participants’ positive orientations to donating and sign-ups to donate blood, this study sought to determine whether distribution of these materials would improve new donors’ attendance rates. Further, we sought to determine the efficacy of distribution through phone calls and e-mail and whether an additive effect of multiple modes would be observed. Consistent with research on tailored messaging and that which suggested the potential additive effect of dual messaging, donor preparation via a combination of electronic brochure and phone call yielded the highest attendance rates. Less than 8% of new donors in this condition did not attend.

While beneficial effects of dual reminders with experienced donors have recently been reported, the superior effect of dual messaging of donors with the enhanced preparation materials has previously only been predicted but not observed. In the study by France and colleagues, participants were exposed via dual modes of brochure and video in quick succession. In this study, the mode of delivery was different and the intervening period between exposure through the different modes was longer, as was the period between exposure to the materials and the opportunity to donate. As such, it is possible that an additive effect occurred because the modes of communication differed or because the e-mailed brochure could be consulted after the salience of the prompt and recall of the information in the phone call had begun to fade.

It is unclear why the phone call coupled with a hard copy brochure did not have an equivalent effect to the phone call paired with an electronic brochure. One explanation may lie in the relative receptiveness of donors to materials distributed via e-mail versus surface mail coupled with the possibility that electronic communication is more engaging. Recipients of the electronic brochure were provided with key information in the body of the e-mail that highlighted its (personal) relevance to them and this may have motivated them to click further to learn more, thereby increasing their exposure. Analysis of the open-and-clickthrough data in the electronic...
Brochure conditions suggests that this is possible. Seventy-two percent of those who were sent the electronic communication opened it, and the clickthrough rate (to access further information) was 3.08 times higher than the current target set for electronic communications within the BCA. In contrast, even though those in the hard copy conditions had the potential to access the same information, they may not have been as encouraged to do so by the format of the brochure. Unlike the landing page of the electronic brochure, the front page of the hard copy brochure did not communicate the personal relevance of the materials. Rather, it comprised a generic image with the brochure title overlaid.

Of course, we cannot determine precisely why the NCC call coupled with an electronic brochure enhanced new donor attendance. Future research that explores how prospective donors interact with the enhanced materials is needed to determine the optimal method, level, and timing of such communication. This may facilitate revisions needed to determine the optimal method, level, and timing of such communication. This may facilitate revisions needed to determine the optimal method, level, and timing of such communication.

Although this research demonstrates the potential benefits of distributing enhanced donor preparation materials to incoming donors, a number of questions remain unanswered. Given the single modality reminder in the control condition, one possibility is that a standard reminder distributed in multiple formats (e.g., e-mail and phone) could have similarly beneficial effects. On the basis of the current data and prior research, this appears unlikely. While reminders improve attendance, research suggests that tailored messages enhance attendance rates further. In addition, in this analysis not all dual-reminder conditions significantly improved attendance rates over those observed in the control condition. This suggests that it was the specific combination of tailored, interactive communications in the NCC and electronic brochure condition that drove the effect rather than reminders simply delivered in multiple formats.

This research is also limited by its focus on a single short-term outcome measure—that is, whether the prospective donor attended to donate. While operationally this is of critical importance, what remains unknown is why the donors did this. Research using the transtheoretical model of behavior change suggests that attendance is facilitated by providing structure to the anticipated experience, reducing anxiety and bolstering self-efficacy.

### TABLE 2. RR of presentation in intervention conditions in comparison to the control (no-contact) condition for those donors who did not cancel in advance

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Hard copy/ NCC contact</th>
<th>Electronic/ NCC contact</th>
<th>No brochure/ NCC contact</th>
<th>Hard copy/ no contact</th>
<th>Electronic/ no contact</th>
<th>RR (in comparison to control condition)</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>1.0513</td>
<td>1.0420</td>
<td>1.0489</td>
<td>1.0462</td>
<td>1.0836</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% CI</td>
<td>1.0013-1.1038</td>
<td>0.9913-1.0954</td>
<td>0.9988-1.1015</td>
<td>0.9960-1.0990</td>
<td>1.0352-1.1343</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>0.0442</td>
<td>0.1058</td>
<td>0.0560</td>
<td>0.0721</td>
<td>0.0006*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significantly different from the control (no-contact) condition when a Bonferroni adjustment for multiple comparisons is made (p < 0.01).

### TABLE 3. RR of presentation or canceling in advance in intervention conditions in comparison to the control (no-contact) condition

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Hard copy/ NCC contact</th>
<th>Electronic/ NCC contact</th>
<th>No brochure/ NCC contact</th>
<th>Hard copy/ no contact</th>
<th>Electronic/ no contact</th>
<th>RR (in comparison to control condition)</th>
<th>95% CI</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td>1.0366</td>
<td>1.0324</td>
<td>1.0339</td>
<td>1.0329</td>
<td>1.0596</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>95% CI</td>
<td>0.9983-1.0763</td>
<td>0.9939-1.0724</td>
<td>0.9955-1.0739</td>
<td>0.9944-1.0728</td>
<td>1.0226-1.0979</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p value</td>
<td>0.0610</td>
<td>0.1002</td>
<td>0.0843</td>
<td>0.0946</td>
<td>0.0014*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significantly different from the control (no-contact) condition when a Bonferroni adjustment for multiple comparisons is made (p < 0.01).
Further, France and colleagues\textsuperscript{26} showed that improvements in self-efficacy drove improved sign-ups. Future research should explore mediating processes to determine which content drives attendance. Research should also consider whether the enhanced preparation materials actually result in an improved donation experience and, as a consequence, heightened retention. Much of the enhanced preparation material focuses on optimizing psychological and physical preparation for donation and managing donation experiences to avoid AEs. Future research should explore whether these strategies are effective in minimizing AEs. Further, the impact on retention of AEs for those exposed to the enhanced predonation materials should also be considered. That is, whether the negative effect of an AE on retention is greater when it occurs in the presence of a mismatch between the donors’ perceptions of control induced by the preparation materials and the reality of their AE.

In sum, our results demonstrate that minor modifications to communications with prospective donors can substantially improve the rate of donor attendance. For many BCAs, calling and e-mailing would-be donors is standard practice. The results of this analysis demonstrate that providing would-be donors with enhanced preparation materials that give a script for donating, mitigate anxiety, and bolster confidence substantially improves attendance rates. This in turn serves to provide the BCA with predictability in supply and the ability to optimally use resources.

**CONFLICT OF INTEREST**

The authors have disclosed no conflicts of interest.

**REFERENCES**


