

Online appendix for “The effect of small quasi-cash rewards on prosocial behavior: the case of voluntary plasma donations”

Stijn Bruers, Erwin Ooghe, and Erik Schokkaert

May 12, 2026

A Randomization of donation centers

A hierarchical cluster analysis based on four variables—the number of monthly donations, the percentage of new donors, the percentage of blood donations relative to total blood and plasma donations, and the standard deviation of monthly donations—was used to classify the 12 donation centers into four clusters of three centers each.¹ Table A1 lists the donation centers, their characteristics, and their allocated cluster.

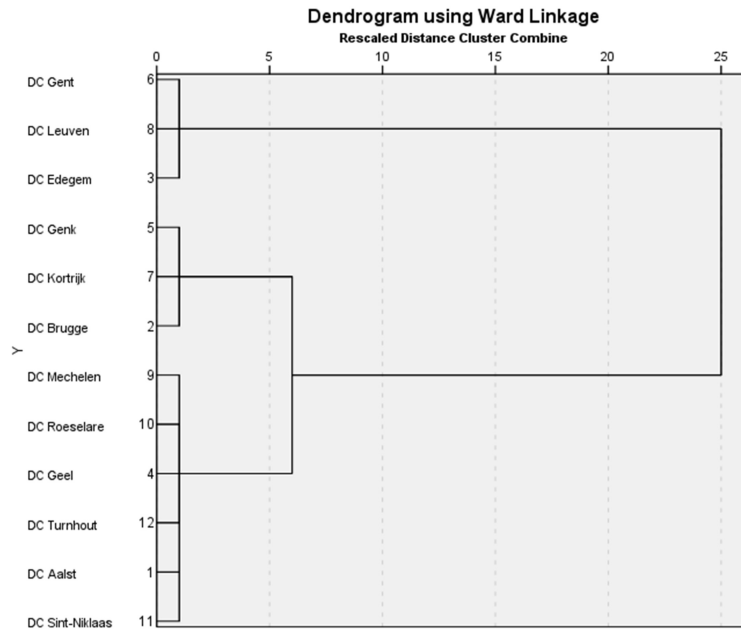
Table A1: Donation center characteristics for cluster analysis

		size (monthly donations)	size as % of largest center	new donors	blood donations	monthly variation (st.dev./avg.)
Gent	1	2453	100%	6.3%	27%	0.14
Leuven	1	2437	99%	5.4%	28%	0.11
Edegem	1	2394	98%	5.8%	34%	0.11
Brugge	2	1855	76%	4.0%	24%	0.11
Genk	2	1668	68%	3.3%	21%	0.14
Kortrijk	2	1497	61%	3.5%	14%	0.12
Roeselare	3	1223	50%	4.6%	17%	0.13
Aalst	3	1030	42%	3.7%	19%	0.13
Sint-Niklaas	3	926	38%	4.2%	22%	0.11
Mechelen	4	1313	54%	5.1%	30%	0.12
Turnhout	4	1116	45%	3.0%	22%	0.10
Geel	4	1090	44%	3.9%	25%	0.10

¹Adding demographic data of donors (gender, age, loyal/infrequent donor, distance to donation center) did not change the resulting clusters.

Figure A1 presents the dendrogram of the cluster analysis. The first cluster consists of the three largest donation centers (Gent, Leuven, and Edegem). These centers also have the highest numbers of new donors—many of whom are students, as these centers are located near universities—and the highest number of blood donations. The second cluster (Genk, Brugge, and Kortrijk) comprises medium-sized centers with relatively few new donors. The third cluster (Roeselare, Aalst, and Sint-Niklaas) includes smaller centers with relatively low numbers of blood donations. The fourth cluster contains the remaining centers (Mechelen, Geel, and Turnhout).

Figure A1: Dendrogram of cluster analysis of donation centers



Each set of three centers within a cluster was then randomly assigned to one of the three treatment groups. This resulted in Brugge, Aalst, Edegem, and Geel forming the control group; Roeselare, Gent, Mechelen, and Genk forming the information group; and Kortrijk, Sint-Niklaas, Leuven, and Turnhout forming the reward group.

B Monthly donations

Table B1: Monthly plasma donations

		control				information				reward			
		C1	C2	C3	C4	I1	I2	I3	I4	R1	R2	R3	R4
before	Nov/21	625	781	1084	493	801	1205	570	692	945	488	535	1274
	Dec/21	762	1004	1223	681	943	1439	746	853	1128	647	690	1397
	Jan/22	734	831	1127	592	806	1108	686	799	971	567	654	1129
	Feb/22	747	901	1122	628	849	1259	667	753	971	561	605	1333
	Mar/22	725	942	1201	707	822	1339	690	859	1033	614	658	1368
	Apr/22	606	754	955	572	717	1106	572	674	947	514	534	1137
	May/22	660	888	1125	581	819	1327	633	718	999	517	572	1340
	Jun/22	724	873	1148	585	868	1242	588	812	1068	653	645	1306
	Jul/22	768	998	1182	698	993	1171	825	864	1062	639	702	1383
	Aug/22	937	1217	1481	839	1246	1520	963	1032	1271	757	808	1637
treatment	Sep/22	771	1018	1199	763	1034	1394	878	974	1203	699	760	1517
	Oct/22	648	793	982	612	757	1225	629	764	904	498	630	1278
	Nov/22	710	791	989	559	876	1277	656	772	986	567	583	1319
	Dec/22	719	825	923	573	807	1311	614	784	980	590	632	1337
	Jan/23	657	785	975	616	815	1124	666	800	1005	534	640	1356
	Feb/23	589	834	920	571	790	1222	599	745	1025	577	601	1301
	Mar/23	741	889	959	637	810	1286	702	872	1093	661	697	1454
	Apr/23	624	749	831	500	675	1110	523	735	983	508	564	1214
	May/23	661	802	914	537	731	1138	601	740	997	513	632	1244
	Jun/23	610	819	907	543	727	1115	531	769	1030	551	609	1187
after	Jul/23	769	991	1202	653	888	1291	805	927	1201	656	752	1373
	Aug/23	896	1148	1401	831	873	1573	938	1087	1352	736	845	1613
	Sep/23	727	909	1000	629	778	1286	689	887	1072	585	739	1191
	Oct/23	619	817	993	575	739	1340	630	856	1023	575	678	1390

Notes: C1 = Aalst, C2 = Brugge, C3 = Edegem, C4 = Geel; I1 = Genk, I2 = Gent, I3 = Mechelen, I4 = Roeselare; R1 = Kortrijk, R2 = Sint-Niklaas, R3 = Turnhout, R4 = Leuven

Table B2: Monthly blood donations

		control				information				reward				local blood drives
		C1	C2	C3	C4	I1	I2	I3	I4	R1	R2	R3	R4	
before	Nov/21	164	467	711	257	335	578	344	203	225	245	277	585	16395
	Dec/21	240	617	577	333	488	833	559	354	340	340	317	713	16238
	Jan/22	221	356	524	200	273	452	358	180	165	189	176	498	18386
	Feb/22	179	293	798	211	237	464	262	127	117	157	148	482	16670
	Mar/22	205	365	500	223	343	618	329	190	198	236	168	614	18145
	Apr/22	172	327	719	200	288	467	291	179	151	172	166	478	14922
	May/22	240	642	731	340	451	718	460	271	292	317	252	730	18602
	Jun/22	260	419	523	230	394	664	428	233	249	260	210	570	17951
	Jul/22	179	313	541	174	228	330	264	166	140	148	174	412	13869
	Aug/22	190	327	577	203	269	465	279	165	176	182	158	474	15708
	Sep/22	216	384	467	241	350	538	322	213	183	232	201	470	16706
treatment	Oct/22	167	300	463	191	261	506	233	124	149	136	138	394	17555
	Nov/22	177	288	608	189	254	477	268	120	152	180	124	424	16839
	Dec/22	268	526	568	284	417	649	421	247	257	230	214	516	15374
	Jan/23	185	306	550	206	275	492	331	161	131	175	169	493	18283
	Feb/23	176	356	593	221	267	545	289	167	176	207	155	498	17010
	Mar/23	224	422	497	200	315	589	329	183	173	199	171	493	19008
	Apr/23	174	255	517	172	257	437	235	140	143	153	139	423	14630
	May/23	221	299	631	218	288	528	319	169	191	195	179	440	16280
	Jun/23	267	344	536	235	345	502	280	180	202	169	182	416	17813
after	Jul/23	180	333	660	192	223	415	249	209	193	168	150	420	14799
	Aug/23	233	446	499	269	295	599	396	247	254	254	216	549	14651
	Sep/23	181	293	481	170	254	418	310	175	163	135	139	409	15564
	Oct/23	169	320	257	204	250	510	291	174	174	140	179	425	17858

Notes: C1 = Aalst, C2 = Brugge, C3 = Edegem, C4 = Geel; I1 = Genk, I2 = Gent, I3 = Mechelen, I4 = Roeselare; R1 = Kortrijk, R2 = Sint-Niklaas, R3 = Turnhout, R4 = Leuven

Table B3: Monthly platelets donations

		control				information				reward			
		C1	C2	C3	C4	I1	I2	I3	I4	R1	R2	R3	R4
before	Nov/21	0	175	171	0	194	191	148	0	0	0	0	385
	Dec/21	0	232	213	0	249	250	171	0	0	0	0	487
	Jan/22	0	154	195	0	209	224	158	0	0	0	0	388
	Feb/22	0	112	173	0	179	183	111	0	0	0	0	339
	Mar/22	0	130	195	0	213	220	137	0	0	0	0	380
	Apr/22	0	190	189	0	192	204	158	0	0	0	0	340
	May/22	0	205	184	0	203	229	170	0	0	0	0	354
	Jun/22	0	188	176	0	181	201	138	0	0	0	0	322
	Jul/22	0	166	173	0	182	189	136	0	0	0	0	322
	Aug/22	0	190	191	0	215	215	150	0	0	0	0	385
	Sep/22	0	191	181	0	178	201	130	0	0	0	0	343
treatment	Oct/22	0	168	150	0	150	177	130	0	0	0	0	297
	Nov/22	0	181	165	0	147	176	150	0	0	0	0	315
	Dec/22	0	214	203	0	211	227	156	0	0	0	0	362
	Jan/23	0	172	182	0	190	187	133	0	0	0	0	314
	Feb/23	0	153	150	0	166	174	116	0	0	0	0	288
	Mar/23	0	185	190	0	196	201	135	0	0	0	0	347
	Apr/23	0	169	171	0	180	181	139	0	0	0	0	305
	May/23	0	224	200	0	212	223	174	0	0	0	0	379
after	Jun/23	0	212	191	0	157	195	155	0	0	0	0	356
	Jul/23	0	239	181	0	152	249	165	0	0	0	0	394
	Aug/23	0	265	230	0	193	297	183	0	0	0	0	438
	Sep/23	0	205	197	0	183	201	166	0	0	0	0	294
	Oct/23	0	228	202	0	207	232	173	0	0	0	0	304

Notes: C1 = Aalst, C2 = Brugge, C3 = Edegem, C4 = Geel; I1 = Genk, I2 = Gent, I3 = Mechelen, I4 = Roeselare; R1 = Kortrijk, R2 = Sint-Niklaas, R3 = Turnhout, R4 = Leuven

C Other displacement effects

Offering information or extra rewards may generate various displacement effects. We focused in the main text on the displacement effect from blood (donated at donation centers) to plasma, but other product displacement effects are also possible—for example, a shift from platelets to plasma, or from blood donated at mobile blood drives to plasma donated at donation centers. In addition, the treatment may affect the timing of donations (e.g., shifting a donation forward or backward by one month) and the location of donations (e.g., shifting from one donation center to another).

C.1 Product displacement effects: platelets and blood drives

Platelets are collected at six of the twelve donation centers. Because platelets have a short shelf life (five days), their collection is tightly managed by the Belgian Red Cross-Flanders, and donors are prompted using more targeted methods—for example, platelet donors are often contacted personally and invited to donate at a specific time. Moreover, platelet donors have particular blood types, which means that switches—either from platelets to plasma or from blood to platelets—are not generally encouraged.² Finally, the number of platelet donations is relatively small compared to blood and plasma donations (three times lower than blood, seven times lower than plasma; see Appendix B). For all these reasons, we do not expect a shift from platelets to plasma (in the reward treatment) or from blood to platelets (in the information treatment).

Blood collection at local blood drives could, in principle, also be affected.³ However, donors who give blood at local blood drives, but not at donation centers, receive the same newsletter as the control group and therefore were not informed about the extra reward for plasma donations. Moreover, as shown in Appendix B, the total number of donations at local blood drives is four times higher than blood donations at donation centers (and 1.6 times higher than plasma donations at donation centers). The standard deviation of monthly blood donations at local drives is also larger than the average monthly plasma donation rate. Consequently, any small shift from donating at blood drives to donating plasma at donation centers would likely not be visible in the data.

Because we do not have individual-level microdata for platelet donations or for blood collected at local blood drives, we estimate the following linear regression model at the donation-center level:

$$\ln D_{dt}^p = \tau_t^p + \delta_d^p + \iota^p I_{dt} + \rho^p R_{dt} + \varepsilon_{dt}^p. \quad (\text{C1})$$

The dependent variable $\ln D_{dt}^p$ is the logarithm of the number of donations of product p at donation center d in month t . The independent variables correspond to those used in the main analysis, but now measured at the donation center level: τ_t^p is a month-by-product fixed effect, δ_d^p is a center-by-product fixed effect, I_{dt} is the information dummy, R_{dt} is the reward dummy, and ε_{dt}^p is the error term. The coefficients ι^p and ρ^p measure the percentage change in total donations (averaged across centers) of product p due to the extra information and reward, respectively. Because this model does not include donor fixed effects, it does not correct for imperfect randomization and is therefore less reliable.

²Donors with blood types O and A are recruited for platelet donations, and are different from the blood types B and AB recruited for plasma donations.

³The reward for a blood donation at a local blood drive is the same as in the control group (i.e., one thank-you coupon). Plasma and platelets are not collected at local blood drives.

Table C1: Reward and information effects for all products

	plasma	blood at donation centers	platelets	blood at local blood drives
information effect	0.033* (0.015)	-0.02 (0.024)	-0.033* (0.015)	0.012 (0.057)
reward effect	0.055** (0.016)	-0.014 (0.026)	-0.006 (0.020)	0.032 (0.064)

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. Cluster robust standard errors between brackets.

Estimates for model (C1) are reported in Table C1. Standard errors are clustered at the donation-center level and are robust to heteroscedasticity and serial correlation. Comparing the center-level estimates for plasma and blood (first two columns) with the more reliable fixed-effects Poisson estimates shows that the information and reward effects are smaller and, as expected, estimated less precisely. The product displacement effect (from blood to plasma) is not statistically significant. Turning to platelets and blood collected at local blood drives (last two columns), we again observe mostly insignificant effects, except for a small negative information effect on platelet donations. These results hence confirm our aforementioned expectations.

C.2 Spatial and temporal displacement, and backlash effects

A spatial displacement effect involves donors shifting between donation centers (as documented, for example, by Lacetera et al., 2014). Plasma donors might donate more often at centers that provide the extra thank-you coupon rather than at centers offering fewer coupons. However, in our field experiment, such an effect is expected to be minimal due to the relatively large distances between donation centers and the fact that donors were not informed about the incentives offered at other centers.⁴

A temporal displacement effect could occur just before the reward period begins: donors informed that the reward will increase next month may postpone their donations to receive the extra reward. Similarly, at the end of the reward period, donors may accelerate their donation to still obtain the higher reward before it expires.

A backlash effect after the reward period would occur if donations dropped by more than the initial increase once the extra reward was removed. Such backlash effects differ from temporal displacement because they imply a sustained decline in donations rather than a

⁴Even without explicit information by the Red Cross, a spatial displacement effect could be the result of word of mouth, i.e., the passing of information between donors.

shift in timing. Backlash could arise if donors react negatively to the removal of the reward, or if the material reward gradually crowds out intrinsic motivation (Bolle & Otto, 2010; Bowles & Polania-Reyes, 2012; Gold, 2019; Janssen & Mendys-Kamphorst, 2004; Bénabou & Tirole, 2006).

We test for spatial displacement, temporal displacement, and potential backlash effects using the following Poisson model estimated at the individual level:

$$E(D_{it}^p \mid \varphi_i^p, \tau_t^p, I_{it}, R_{it}, RB_{it}, RE_{it}, S_{it}^m, C_{it}^m) = \exp \left(\varphi_i^p + \tau_t^p + \iota^p I_{it} + \rho^p R_{it} + \beta^p RB_{it} + \eta^p RE_{it} + \sum_{m=4}^9 \beta^{pm} S_{it}^m + \sum_{m=10}^{11} \gamma^{pm} C_{it}^m \right), \quad (\text{C2})$$

where the new variables—relative to equation (1)—capture different displacement mechanisms:

- RB_{it} : temporal displacement at the start of the reward treatment period. It equals -1 if donor i does not receive an extra reward in month t but will receive one in month $t + 1$; it equals 1 if donor i receives an extra reward in month t but did not receive one in month $t - 1$. For reward-group donors, this variable is -1 in the month before the reward period and 1 in the first reward month. Postponing a donation means 1 extra donation in month $t + 1$ and 1 donation less in month t .
- RE_{it} : temporal displacement at the end of the reward period. It equals 1 if donor i receives an extra reward in month t but not in month $t + 1$, -1 if the donor does not receive an extra reward in month t but did receive it in month $t - 1$, and 0 otherwise.
- S_{it}^m for $m = 4, \dots, 9$: spatial displacement during months 4-9 (the reward period). For reward period month m , it equals -1 if donor i , who is assigned to a donation center of the non-reward group, donates at a non-reward center, and equals 1 if donor i donates at a reward center. It is 0 otherwise. A shift from one's assigned center to a reward-group center produces a $-1/+1$ pattern.
- C_{it}^m for $m = 10, 11$: backlash effects in months 10-11 (the two months after the reward period). Negative estimated γ values indicate a drop in donations after the reward is discontinued—exceeding any initial increase at reward introduction.

Table C2 reports the parameter estimates. None of the displacement effects—temporal, spatial or backlash—is significant.

Table C2: Spatial displacement, temporal displacement, and backlash effects for plasma

	plasma
Information effect	0.056*** (0.027; 0.086)
Reward effect	0.099** (0.043; 0.155)
Temporal displacement effect at introduction of reward	-0.014 (-0.092; 0.064)
Temporal displacement effect at discontinuation of reward	0.049 (-0.030; 0.128)
Spatial displacement effect 1st month of reward period	-0.021 (-0.068; 0.026)
Spatial displacement effect 2nd month of reward period	-0.013 (-0.052; 0.026)
Spatial displacement effect 3rd month of reward period	-0.009 (-0.048; 0.030)
Spatial displacement effect 4th month of reward period	-0.009 (-0.049; 0.030)
Spatial displacement effect 5th month of reward period	-0.029 (-0.069; 0.011)
Spatial displacement effect 6th month of reward period	-0.049 (-0.101; 0.002)
Backlash effect 1st month after discontinuation of reward	0.093* (0.003; 0.183)
Backlash effect 2nd month after discontinuation of reward	0.026 (-0.012; 0.064)

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. 95% cluster robust confidence intervals between brackets.

D Robustness checks

As a first robustness check, we estimate a simple fixed-effects linear model.⁵ To ensure that the parameters retain the interpretation of average marginal effects (as in the Poisson model), the dependent variable is defined as the number of donations D_{it}^p by donor i at month t , divided by the total sample average donations $\bar{D}^p = \frac{1}{24n} \sum_{it} D_{it}^p$. Hence, we estimate:

$$\frac{D_{it}^p}{\bar{D}^p} = \varphi_i^p + \tau_t^p + \iota^p I_{it} + \rho^p R_{it} + \varepsilon_{it}^p. \quad (\text{D1})$$

⁵The alternative fixed effects negative binomial model did not converge. After approximately 30 iterations, the estimates and standard errors of the information and reward effects (not the fixed effects) were remarkably similar to the Poisson model. We do not report them here, but they are available upon request.

Table D1 shows the results. The estimated information and reward effects on plasma are slightly smaller than those in the benchmark Poisson model; the product displacement effects become slightly smaller (in absolute value) and the reward effect is no longer statistically significant.

Table D1: Results of the linear model

	FE Poisson model		FE linear model	
	plasma	blood	plasma	blood
information effect	0.046*** (0.012)	-0.011 (0.014)	0.041*** (0.011)	0.002 (0.013)
reward effect	0.071*** (0.013)	-0.033* (0.016)	0.056*** (0.013)	-0.026 (0.015)
N	43007	46578	43007	46578
RMSE	0.430	0.349	0.969	0.994
BIC	873215.1	486337.6	8933699	11100000

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. Standard errors are clustered at the individual level.

As a second robustness check, we consider alternative clustering levels and methods for computing standard errors. In our benchmark results, we reported standard errors clustered at the individual level, which seems reasonable given that donations by the same donor are naturally correlated over time. However, donors were assigned to donation centers, and the randomization occurred at the donation-center level. Therefore, correlations in donations within the same center may also affect the standard errors (Cameron & Miller, 2015).

Table D2 reports the main results (FE Poisson model with standard errors clustered at the individual level) alongside the corresponding estimates when clustering at the center level and when clustering at both the individual and center levels.⁶ In most cases, the standard errors are substantially smaller when clustered at the donation-center level rather than at the individual level. Indeed, MacKinnon et al. (2023) have warned that clustered standard errors become implausibly small when the number of clusters is limited.⁷

⁶For the two-level clustering (at individual donor and donation center), Stata packages `ppmlhdfe` and `reghdfe` were used. The package `ppmlhdfe` implements the Poisson pseudo-maximum likelihood regression model with high-dimensional fixed effects (Correia, Guimarães & Zylkin, 2019), whereas `reghdfe` runs the linear regression model with high-dimensional fixed effects (Correia, 2016).

⁷In our context, we have only twelve clusters corresponding to the twelve donation centers, and each cluster contains roughly 90,000 observations (3,750 donors per center over 24 months).

Table D2: Standard errors clustered at different levels

	FE Poisson model	
	plasma	blood
information effect	0.046	-0.011
at id level	(0.012)***	(0.014)
at dc level	(0.003)***	(0.021)
at id & dc level	(0.006)***	(0.022)
reward effect	0.071	-0.033
at id level	(0.013)***	(0.016)*
at dc level	(0.004)***	(0.009)***
at id & dc level	(0.006)***	(0.009)***

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively; The abbreviations id and dc stand for individual and donation center level.

We also applied a wild bootstrap procedure, even though it is known to perform poorly when the number of clusters is small (MacKinnon and Webb, 2018). The wild bootstrap is typically available only for calculating confidence intervals under single-way clustering in linear models.⁸ Table D3 reports the 95% confidence intervals from the benchmark linear model estimates, both with and without wild bootstrapping. Bootstrapping often narrows the confidence intervals. Moreover, when clustered at the individual level, the bootstrapped and non-bootstrapped intervals differ little, confirming that bootstrapping is unnecessary at this level and misleading when clustered at the donation-center level.

Table D3: 95% confidence intervals using a wild bootstrap

	FE linear model	
	plasma	blood
information effect	0.041	0.002
at id level	[0.019,0.062]	[-0.024,0.029]
wild at id level	[0.020,0.062]	[-0.022,0.026]
at dc level	[0.024,0.057]	[-0.148,0.152]
wild at dc level	[0.040,0.041]	[-0.165,0.208]
reward effect	0.056	-0.026
at id level	[0.031,0.081]	[-0.055,0.002]
wild at id level	[0.031,0.081]	[-0.054,0.001]
at dc level	[0.045,0.066]	[-0.291,0.238]
wild at dc level	[0.054,0.057]	[-0.320,0.330]

Notes: The abbreviations id and dc stand for individual and donation center level.

⁸We used the BOOTTEST command in Stata (Roodman, 2015), which allows only to compute confidence sets for single-way clustering in linear models.

As a third robustness check, given the small number of donation centers, we investigate whether our results could be driven by a single center experiencing a random shock. Figure D1 plots average monthly donations by donation center in the pre-reward period on the horizontal axis and in the six-month reward period on the vertical axis.⁹ The upward-sloping line represents the average of the control and information-group centers (as if the eight centers were aggregated into one). Donation centers showing unusually large increases in donations during the reward period appear above this line. For plasma donations, all four centers in the reward group fall into this category, indicating that the reward effect is not driven by an outlier. The same pattern holds for the product displacement effect: blood donations at all four reward-group centers are unusually low during the reward period and fall below the line representing the average of control and information centers. Thus, each of the four reward-group centers exhibits both the reward effect and the displacement effect (though not always with statistical significance). A similar pattern can be observed for the information effect: each of the four information-group centers has a higher donation rate during the nine-month information period relative to the average of the four control centers.¹⁰

As a fourth robustness check, we assess the sensitivity of our estimates to the upward spike in plasma donations in post-treatment month 13 (October 2023) for the information and reward groups. Table D4 presents the benchmark Poisson estimates with and without this final post-treatment month. As expected, excluding this outlier month slightly increases both the information and reward effects.

Table D4: Leaving out post-treatment month 13

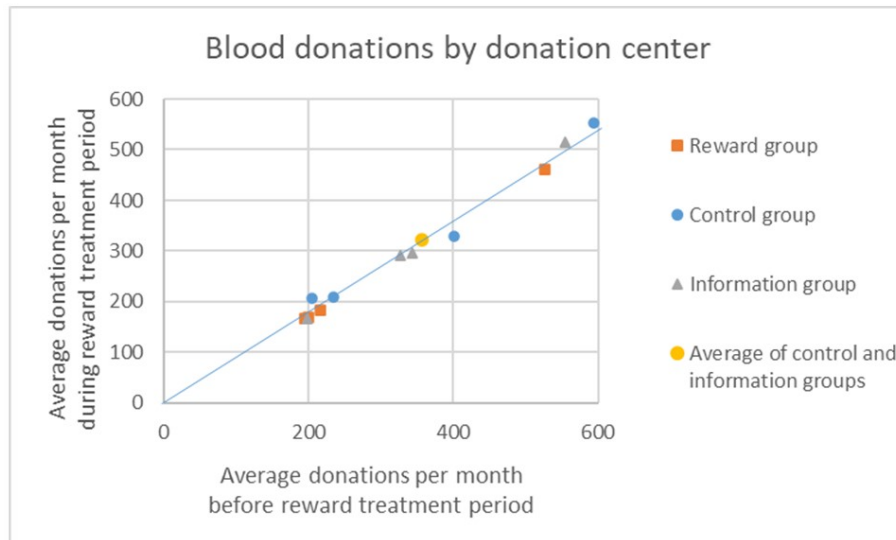
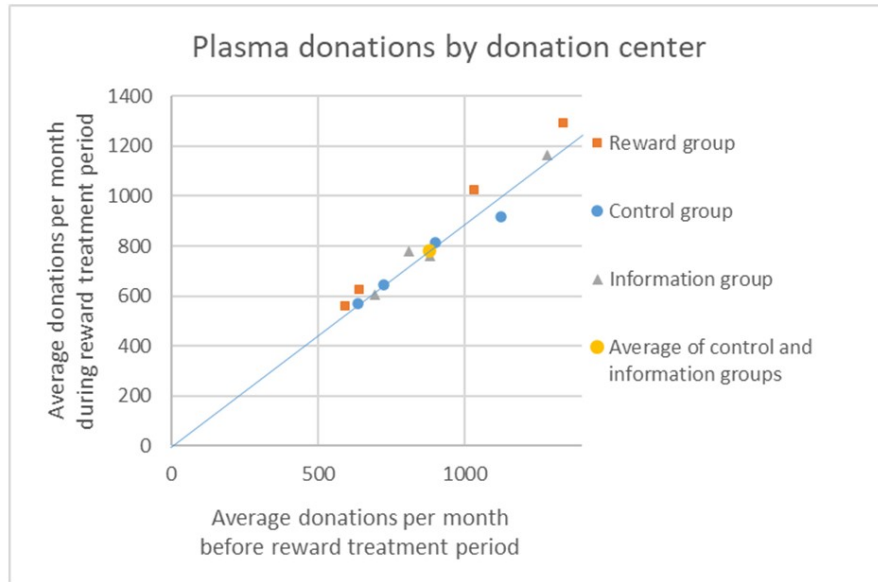
	with month 13		without month 13	
	plasma	blood	plasma	blood
information effect	0.046*** (0.012)	-0.011 (0.014)	0.052*** (0.012)	-0.009 (0.014)
reward effect	0.071*** (0.013)	-0.033* (0.016)	0.073*** (0.013)	-0.035* (0.017)
N	43007	46578	41545	45381
RMSE	0.430	0.349	0.431	0.347
BIC	873215.1	486337.6	827708.6	463263.4

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. Standard errors are clustered at the individual level. Reported estimates are the average marginal effects.

⁹The raw data can be found in Tables B1 and B2 in Online Appendix B.

¹⁰Figures are available upon request.

Figure D1: Average monthly donations per donation center before and during the reward treatment period



Note: the solid diagonal line runs through the average of the control and information group donation rates.

E Heterogeneity over individuals and time

Table E1 shows separate fixed-effects Poisson model estimates for different complementary subgroups.

Table E1: Heterogeneity of reward and information effects

	reward effect		information effect	
	plasma	blood	plasma	blood
women	0.084*** (0.050; 0.117)	-0.054* (-0.103; -0.005)	0.053** (0.021; 0.085)	0.016 (-0.025; 0.056)
men	0.056** (0.019; 0.092)	-0.016 (-0.058; 0.027)	0.038* (0.004; 0.073)	-0.031 (-0.067; 0.004)
difference	0.028 (-0.022; 0.079)	-0.038 (-0.104; 0.027)	0.015 (-0.034; 0.063)	0.047 (-0.007; 0.101)
loyal donors	0.065*** (0.040; 0.090)	-0.020 (-0.054; 0.015)	0.053*** (0.029; 0.076)	-0.006 (-0.034; 0.023)
infrequent donors	0.080 (-0.051; 0.211)	-0.142*** (-0.221; -0.062)	0.050 (-0.054; 0.155)	0.027 (-0.034; 0.089)
difference	-0.015 (-0.112; 0.083)	0.122** (0.040; 0.204)	0.002 (-0.077; 0.082)	-0.033 (-0.098; 0.032)
distance > 10 km	0.080*** (0.044; 0.117)	-0.003 (-0.054; 0.048)	0.040* (0.007; 0.073)	-0.013 (-0.053; 0.027)
distance < 10 km	0.063*** (0.029; 0.097)	-0.055** (-0.097; -0.014)	0.054** (0.020; 0.088)	-0.009 (-0.045; 0.027)
difference	0.018 (-0.086; 0.121)	0.052 (-0.013; 0.118)	-0.014 (-0.119; 0.091)	-0.004 (-0.058; 0.049)
year of birth < 1986	0.067*** (0.038; 0.096)	-0.001 (-0.041; 0.039)	0.024 (-0.003; 0.051)	-0.045** (-0.077; -0.012)
year of birth > 1986	0.078** (0.033; 0.123)	-0.074** (-0.127; -0.021)	0.103*** (0.057; 0.150)	0.030 (-0.016; 0.077)
difference	-0.011 (-0.065; 0.043)	0.073* (0.007; 0.140)	-0.080** (-0.134; -0.025)	-0.075** (-0.132; -0.019)

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. Standard errors are clustered at the individual level. Reported confidence intervals (between brackets) are at the 95% level. The estimates are the average marginal effects.

Overall, there are no significant differences for our most important finding: the positive reward effect on plasma donations. The results suggest that the information effects on plasma and blood donations may be stronger for younger and older donors, respectively, and that the negative reward effect on blood appears more pronounced for infrequent and younger donors. These patterns are intuitive but relatively weak. Given that we test multiple hypotheses, it is appropriate to apply a stricter significance threshold—for example, a p-value below 0.01.¹¹

¹¹E.g., the Bonferroni-corrected significance level equals $0.05/16 < 0.01$ for the 16 tests in Table E1.

With this stricter criterion, none of the observed differences remains statistically significant.

To examine temporal dynamics, we extend the fixed-effects Poisson model in equation (1) by allowing the reward and information effects to vary over time:

$$E(D_{it}^p \mid \varphi_t^p, \tau_t^p, I_{it}^m, R_{it}^m) = \exp \left(\varphi_i^p + \tau_t^p + \sum_{m=1}^{13} \iota^{pm} I_{it}^m + \sum_{m=4}^{13} \rho^{pm} R_{it}^m \right) \quad (\text{E1})$$

where months 1 to 9 constitute the information period, months 4 to 9 the reward period, and months 10 to 13 the post-experiment period. The dummy variables I_{it}^m and R_{it}^m are defined as before but now vary by month. Table E2 reports the formal results.

Table E2: Parameter estimates of monthly reward and information effects

	period	month	plasma		blood	
reward effect	reward period	Jan/23	0.068**	(0.023)	-0.034	(0.042)
		Feb/23	0.073**	(0.023)	0.026	(0.041)
		Mar/23	0.092***	(0.023)	-0.084*	(0.040)
		Apr/23	0.102***	(0.024)	0.009	(0.045)
		May/23	0.084**	(0.025)	-0.032	(0.041)
		Jun/23	0.102***	(0.025)	-0.071	(0.042)
	post experiment	Jul/23	0.048*	(0.023)	0.065	(0.044)
		Aug/23	0.047*	(0.023)	0.040	(0.038)
		Sep/23	0.016	(0.025)	-0.085	(0.045)
		Oct/23	0.058*	(0.025)	-0.060	(0.044)
information effect	information period	Oct/22	0.038	(0.021)	-0.030	(0.037)
		Nov/22	0.084***	(0.021)	0.006	(0.037)
		Dec/22	0.090***	(0.021)	-0.016	(0.030)
		Jan/23	0.042	(0.025)	0.005	(0.039)
		Feb/23	0.068**	(0.024)	-0.018	(0.039)
		Mar/23	0.055*	(0.025)	-0.006	(0.037)
		Apr/23	0.045	(0.026)	-0.017	(0.043)
		May/23	0.023	(0.026)	0.048	(0.039)
		Jun/23	0.014	(0.026)	-0.113**	(0.038)
	post experiment	Jul/23	0.005	(0.025)	-0.115**	(0.042)
		Aug/23	-0.029	(0.024)	-0.036	(0.036)
		Sep/23	0.035	(0.026)	0.022	(0.042)
		Oct/23	0.098***	(0.027)	0.052	(0.041)

Notes: *, **, *** indicate statistical significance at the 0.05, 0.01 and 0.001 level respectively. Standard errors are clustered at the individual level. Reported estimates are the average marginal effects.

For plasma, the information effect initially increases and then decreases over time. After peaking at an increase of 9.0% in the third month of the information treatment period, the information effect declines to 1.4% in the ninth (final) month. In the post-experiment period,

the information effect remains low (with the exception of the last month, for reasons noted earlier). This fading pattern suggests that donors gradually become accustomed to receiving the information and no longer respond strongly to it. As an additional robustness check, we note that there are no significant differences in information effects between the information and reward groups during the three months before the reward was introduced.¹²

In contrast, the reward effect for plasma does not fade out. Instead, it shows an increasing trend over the six-month reward period, rising from 6.8% to 10.2% per month. This upward pattern may reflect the fact that more donors become aware of the higher rewards over time. Even donors who do not open the newsletter might learn about the extra coupon upon visiting a donation center, and this could lead them to donate more frequently. The reward effect also displays some inertia: immediately after the reward period ends, there is a small, positive—but statistically insignificant—residual effect that later disappears. This inertia may stem from donors who were unaware that the extra reward had been discontinued and therefore arrived expecting to receive it. By contrast, the shift effects on blood donations are no longer statistically significant when estimating month-by-month effects, likely because of reduced statistical power in these finer time-specific models.

References

- Bénabou, R., & Tirole, J. (2006). Incentives and prosocial behavior. *The American Economic Review*, 96(5), 1652-1678.
- Bolle, F., & Otto, P. E. (2010). A price is a signal: On intrinsic motivation, crowding-out, and crowding-in. *Kyklos*, 63(1), 9-22.
- Bowles, S., & Polania-Reyes, S. (2012). Economic incentives and social preferences: substitutes or complements? *Journal of Economic Literature*, 50(2), 368-425.
- Cameron, C., & Miller, L. (2015). A practitioner's guide to cluster-robust inference. *Journal of human resources*, 50(2), 317-372.
- Correia, S. (2016). A feasible estimator for linear models with multi-way fixed effects. Preprint at <http://scoreia.com/research/hdfe>.
- Correia, S., Guimarães, P., & Zylkin, T. (2019). *ppmlhdfe*: Fast Poisson estimation with high-dimensional fixed effects. Preprint at [arXiv.org](https://arxiv.org).
- Gold, N. (2019). The limits of commodification arguments: framing, motivation crowding, and shared valuations. *Politics, Philosophy & Economics*, 18(2), 165-192.

¹²The difference in information effects (information group minus reward group) is 0.007, p-value 0.37.

- Janssen, M.C., & Mendys-Kamphorst, E. (2004). The price of a price: on the crowding-out and in of social norms. *Journal of Economic Behavior & Organization*, 55(3), 377-395.
- MacKinnon, J.G., Nielsen, M.Ø. & Webb, M.D. (2023). Cluster-robust inference: A guide to empirical practice. *Journal of Econometrics* 232(2), 272-299.
- MacKinnon, J.G. & Webb, M.D. (2018). The wild bootstrap for few (treated) clusters. *The Econometrics Journal* 21(2), 114-135.
- Roodman, D. (2015). BOOTTEST: Stata module to provide fast execution of the wild bootstrap with null imposed. Statistical Software Components S458121, Boston College Department of Economics, revised 16 Jan 2025.