Intertemporal Altruism: Temporal Preferences in Prosocial Behavior

Evidence from Blood Donation and Volunteering Decisions

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Abstract

Background: Temporal discounting of monetary rewards is well-established, but little is known about how people value the timing of prosocial actions. Do individuals prefer to help sooner or later? This study introduces "intertemporal altruism"—temporal preferences for charitable behaviors—and examines factors that predict these preferences.

Methods: We conducted a pre-registered online experiment with 361 UK adults recruited via Prolific. Participants made hypothetical decisions about blood donation and volunteering appointments across two time horizons (1-month and 6-month delays). We measured timing preferences (earlier vs. later vs. decline), willingness-to-accept (WTA) compensation for rescheduling, and individual differences in warm glow motivation and effective altruism orientation. Participants were randomly assigned to charity-funded or research-funded compensation framing conditions.

Results: Participants strongly preferred earlier prosocial action: 72% chose earlier volunteering at the 1-month horizon and 77% at the 6-month horizon (both $p < .001$ vs. chance). Blood donor status significantly predicted timing preferences ($\chi^2 = 43.46$, $p < .001$, Cramér's $V = 0.26$), with current donors showing the strongest preference for earlier appointments. Current donors required £6.42 less compensation than non-donors ($p = .011$). Charity-funded framing reduced WTA by £9.29 compared to research-funded framing ($d = 0.55$, $p < .001$). Warm glow motivation predicted preference for later timing (OR = 0.46, $p = .04$), while effective altruism orientation showed no significant effect.

Conclusions: People exhibit "negative discounting" for prosocial behavior, preferring to help sooner rather than later. Donor experience, motivational orientation, and compensation framing moderate these preferences, with implications for charitable organizations designing donation scheduling and incentive programs.

Keywords: intertemporal choice, prosocial behavior, temporal discounting, blood donation, volunteering, warm glow, effective altruism

1 Introduction

Imagine you have decided to donate blood. Would you prefer an appointment next week or next month? This seemingly simple question touches on a fundamental aspect of human decision-making that remains poorly understood: how do people value the *timing* of prosocial actions? While behavioral economists have extensively documented how individuals discount future monetary rewards (Frederick et al., 2002; Green et al., 1994), surprisingly little is known about whether—and how—people discount future opportunities to help others.

This question carries significant practical implications. Blood banks struggle with appointment no-shows and scheduling inefficiencies (van Dongen and Roos, 2021). Charitable organizations must decide whether to solicit immediate donations or future pledges (Breman, 2011). Volunteer coordinators face choices about when to schedule service opportunities (Penner et al., 2005). Understanding temporal preferences for prosocial behavior could inform the design of more effective systems for mobilizing charitable action.

This paper introduces the concept of *intertemporal altruism*—the temporal preferences people hold for prosocial actions—and presents the first systematic investigation of these preferences across multiple domains and time horizons.

1.1 Temporal Discounting: From Money to Prosocial Behavior

Temporal discounting—the tendency to value immediate outcomes more than delayed ones—is among the most robust findings in behavioral economics (Ainslie, 1975; Loewenstein and Prelec, 1992; Read, 2004). People reliably prefer \$100 today over \$100 next month, exhibiting what economists term "positive" discounting. This pattern appears across cultures (Falk et al., 2018), age groups (Green et al., 1994), and outcome types including health (Chapman, 1996) and environmental goods (Hardisty et al., 2010).

However, theoretical considerations suggest that prosocial behavior may not follow the same temporal dynamics as personal consumption. Three perspectives offer competing predictions.

The Warm Glow Hypothesis. Andreoni (1990) proposed that charitable giving generates "warm glow"—intrinsic satisfaction from the act of giving itself, independent of the gift's impact. Subsequent research has confirmed that donors experience positive emotions (Dunn et al., 2008), neural reward activation (Harbaugh et al., 2007), and enhanced well-being (Aknin et al., 2013) from giving. Crucially, if warm glow is experienced at the moment of *commitment* rather than *execution*, individuals might prefer to schedule prosocial actions in the future, savoring an extended period of anticipatory satisfaction (Loewenstein, 1987). This suggests that high warm glow individuals may exhibit preferences for *later* prosocial action.

The Effective Altruism Perspective. In contrast, the effective altruism movement emphasizes maximizing the impact of prosocial behavior (MacAskill, 2015b; Singer, 2015). From this consequentialist viewpoint, delayed helping is costly: each day of postponed action represents potential suffering that could have been prevented (Ord, 2013). Individuals oriented toward impact maximization should therefore prefer *earlier* prosocial action to minimize the opportunity cost of delay. This perspective also suggests that experienced donors, who have internalized the value of timely contribution, would show stronger preferences for immediate action.

Cost Discounting. A third possibility draws on asymmetric discounting of costs versus benefits (Hardisty and Weber, 2013). Prosocial actions typically involve immediate costs (time, effort, discomfort) in exchange for benefits to others. If individuals discount future costs more steeply than future benefits, they might paradoxically prefer to commit to future prosocial actions—viewing distant costs as psychologically smaller while the benefit of having committed is immediate (Rogers and Bazerman, 2014).

1.2 The Gap: Limited Evidence on Prosocial Temporal Preferences

Despite these rich theoretical predictions, empirical evidence on prosocial temporal preferences remains scarce. Koehler and Poon (2009) found that people were more likely to volunteer for tasks scheduled in the distant future, suggesting a form of "hyperopia" in prosocial contexts. Breman (2011) demonstrated that soliciting pledges for future donations increased giving compared to immediate requests. However, these studies did not directly measure timing preferences or examine individual difference predictors.

Blood donation offers an ideal context for studying intertemporal altruism. Unlike monetary donations, blood donation involves scheduling discrete appointments with concrete temporal parameters. Prior research has examined donation motivations (Ferguson et al., 2008; Piliavin and Charng, 1990), barriers (France et al., 2010), and retention (Schreiber et al., 2006), but not temporal preferences for *when* people prefer to donate.

Several questions remain unanswered. First, do people exhibit positive or negative discounting for prosocial behavior? Second, does prior experience with prosocial action (e.g., being an active blood donor) shape temporal preferences? Third, do warm glow and effective altruism orientations predict different timing preferences, as theory suggests? Fourth, how does the framing of incentives affect willingness to reschedule prosocial commitments?

1.3 The Present Study: Hypotheses

We conducted a pre-registered experiment examining temporal preferences for blood donation and volunteering. Participants chose between earlier and later appointments and indicated their willingness-to-accept (WTA) compensation for rescheduling, providing both choice-based and monetary measures of temporal preferences.

We tested six hypotheses organized into primary and secondary sets:

Primary Hypotheses.

H_1: Blood donor status predicts timing preferences. Current and lapsed donors will show stronger preferences for earlier appointments than non-donors, reflecting internalized norms about timely contribution.

H_2: Blood donor status predicts WTA compensation. Current donors will require less compensation to reschedule appointments, indicating that donor identity reduces attachment to specific timing.

H_3: Participants will prefer earlier volunteering appointments over later appointments at rates significantly exceeding chance (50%), demonstrating negative discounting of prosocial behavior.

Secondary Hypotheses.

H_4: Warm glow motivation predicts preference for *later* timing. Individuals high in warm glow enjoy extended anticipation of helping.

H_5: Effective altruism orientation predicts preference for *earlier* timing. EA-oriented individuals prioritize immediate impact.

H_6: Source framing affects WTA. Compensation described as charity-funded will reduce WTA compared to research-funded framing, as accepting charity money to reschedule violates prosocial norms (Gneezy et al., 2011).

We also conducted exploratory analyses examining cross-domain correlations (E1) and the effect of lives-saved framing on WTA (E2).

1.4 Overview of Approach

We recruited 361 UK adults through Prolific Academic. Participants completed hypothetical scenarios involving blood donation and volunteering appointment scheduling across two time horizons (1-month and 6-month delays). We measured timing preferences (earlier vs. later vs. decline) and WTA compensation for rescheduling (£0–50 scale). Individual differences in warm glow and effective altruism orientation were assessed using established measures (Carpenter and Myers, 2021; Falk et al., 2018). Participants were randomly assigned to charity-funded or research-funded compensation framing conditions.

1.5 Contributions

This study makes three primary contributions. First, we introduce and operationalize "intertemporal altruism" as a construct, providing the first systematic measurement of temporal preferences across multiple prosocial domains. Second, we test competing theoretical predictions about how warm glow versus effective altruism orientations shape these preferences. Third, we demonstrate that framing of incentives substantially affects prosocial scheduling decisions, with implications for the design of donation systems and volunteer programs. Together, these findings extend intertemporal choice theory into the prosocial domain and offer practical guidance for organizations seeking to optimize the timing of charitable action.

2 Methods

2.1 Pre-registration and Ethical Approval

This study was pre-registered on [OSF/AsPredicted: URL to be added] prior to data collection. All hypotheses, exclusion criteria, and primary analyses were specified in advance. The study protocol received ethical approval from [Institution] Research Ethics Committee (Reference: [XXX]). All participants provided informed consent electronically before participating, and the study was conducted in accordance with the Declaration of Helsinki.

2.2 Participants and Data Sources

2.2.1 Recruitment

Participants were recruited through Prolific Academic, an online research platform that maintains a diverse participant pool with verified demographic information (Palan and Schitter, 2018; Peer et al., 2017). Eligibility criteria included: (a) UK residence, (b) age 18 or older, (c) fluency in English, and (d) a Prolific approval rating of 95% or higher.

2.2.2 Data Collection

Data were collected in two waves during July–August 2025:

- **Wave 1** (July 22, 2025): Primary data collection ($n = 385$ responses)

- **Wave 2** (August 1, 2025): Top-up sample to reach target ($n = 100$ responses)

The two datasets were combined, yielding 485 total responses across 62 variables prior to exclusions.

2.2.3 Exclusion Criteria

Pre-registered exclusion criteria were applied sequentially:

1. **Manual exclusion flag**: Responses flagged during data collection for technical issues or duplicate submissions
2. **Attention check 1**: Participants who failed the first attention check item (correct response = 3)
3. **Attention check 2**: Participants who failed the second attention check item (correct response = 100)
4. **Bot detection**: Responses with bot detection scores exceeding threshold

After applying exclusions, the final analytic sample comprised $N = 361$ participants (74.4% retention rate). This sample size provides 80% power to detect small-to-medium effects ($d = 0.30$) in between-group comparisons at $\alpha = .05$.

2.2.4 Sample Characteristics

The final sample had a mean age of 43.5 years (SD = 13.5, range: 18–74). Regarding blood donation history, 58.7% were non-donors (never donated blood), 13.3% were lapsed donors (previously donated but not within the past 2 years), and 20.8% were current donors (donated within the past 2 years). Participants were randomly assigned to the Charity pays ($n = 181$) or Research pays ($n = 180$) framing condition. Balance tests confirmed successful randomization across all baseline variables (all $p > .17$; see Table 2).

2.3 Design and Procedure

2.3.1 Experimental Design

The study employed a mixed factorial design with framing condition (Charity pays vs. Research pays) as a between-subjects factor and time horizon (1-month delay vs. 6-month delay) as a within-subjects factor. The prosocial domain (blood donation vs. volunteering) was also varied within subjects.

2.3.2 Procedure

Participants completed the online survey via Qualtrics, with a median completion time of approximately 12 minutes. The procedure consisted of the following phases:

Phase 1: Baseline Measures. Participants first completed demographic questions (age, gender, education, household income) followed by measures of blood donation history, prior charitable giving, and volunteering frequency.

Phase 2: Individual Difference Measures. Participants completed the Falk Global Preferences Survey patience items (Falk et al., 2018), a dictator game allocation task, a crowded-out dictator game (to measure warm glow), and the Carpenter giving orientation item (Carpenter and Myers, 2021).

Phase 3: Blood Donation Scenarios. Participants were presented with a hypothetical blood donation scenario. They imagined having decided to donate blood and were asked to choose between:

- An appointment in **1 week** (Earlier option)
- An appointment in **1 month** or **6 months** (Later option, varied by horizon)
- **Not donating at all**

Following their choice, participants who selected Earlier or Later indicated their willingness-to-accept (WTA) compensation for rescheduling to the non-preferred time, using a slider scale from £0 to £50.

Phase 4: Volunteering Scenarios. An analogous procedure was followed for a hypothetical 2-hour volunteering commitment at a local charity, with identical timing options and WTA elicitation.

Phase 5: Lives-Saved Framing (Exploratory). A subset of participants completed an additional scenario in which compensation was framed in terms of "lives saved" rather than monetary value.

Phase 6: Attention Checks and Debriefing. Two attention check items were embedded throughout the survey. Participants were debriefed about the study's purpose and thanked for their participation.

2.4 Measures

2.4.1 Primary Outcome Variables

Timing Preference. For each scenario (blood donation, volunteering) and time horizon (1-month, 6-month), participants indicated their preferred appointment timing: (1) Earlier (1 week), (2) Later (1 month or 6 months), or (3) Not at all (decline to participate). This variable was treated as ordinal in some analyses (ordered logistic regression) and decomposed into two binary outcomes for hurdle models: (a) willingness to donate/volunteer (choices 1–2 vs. 3), and (b) timing preference among those willing (choice 1 vs. 2).

Willingness-to-Accept (WTA). WTA was measured using a slider scale ranging from £0 to £50, with the prompt: "What is the minimum amount of money you would need to be paid to switch from your preferred appointment time to the other time?" Values were censored at the floor (£0) and ceiling (£50). Approximately 17% of responses were at £0 and 18% at £50, yielding a total censoring rate of approximately 35%.

2.4.2 Predictor Variables

Blood Donor Status. Classified based on self-reported donation history into three categories: *Non-donor* (never donated blood), *Lapsed donor* (donated previously but not within the past 2 years), or *Current donor* (donated within the past 2 years). This variable was dummy-coded with Non-donor as the reference category.

Framing Condition. Participants were randomly assigned to one of two conditions. In the *Charity pays* condition, compensation for rescheduling was described as "funded by a charitable organization." In the *Research pays* condition, compensation was described as "funded by the research team." Coded as 1 = Charity pays, 2 = Research pays.

Warm Glow Measures. Two measures captured warm glow motivation:

- *Behavioral* (`wg_z`): Allocation in a crowded-out dictator game, standardized (z-scored). Higher values indicate greater warm glow giving.
- *Attitudinal* (`wg_pref`): Binary indicator based on the Carpenter giving orientation item (Carpenter and Myers, 2021). Participants who reported preferring giving that "feels good" over giving that "does the most good" were coded as 1.

Effective Altruism Measures. Two parallel measures captured effective altruism orientation:

- *Behavioral* (`ea_z`): Allocation in a standard dictator game, z-scored.
- *Attitudinal* (`ea_pref`): Binary indicator for participants who reported preferring giving that "does the most good" over giving that "feels good."

Monetary Patience. Measured using the Falk et al. Global Preferences Survey patience items (Falk et al., 2018). A composite score was computed following the validated weighting: $\texttt{falk} = \texttt{falk\_quant} \times 0.712 + \texttt{falk\_qual} \times 0.288$.

2.4.3 Control Variables

Models included the following covariates: age (continuous), gender (categorical), education level (categorical), household income (z-scored), prior monetary donations (z-scored as `cash_gift_z`), volunteering frequency (z-scored as `vol_z`), closeness to chosen charity

(IOS scale, z-scored as `ios_z`), perceived urgency of the cause (z-scored as `urg_z`), and attention check performance (`acq_pass`: 1 = passed both checks).

2.4.4 Derived Variables

Temporal discount slopes were computed as the change in WTA per month of delay:

$$\text{Discount Slope} = \frac{\text{WTA}_{6\text{mo}} - \text{WTA}_{1\text{mo}}}{5} \tag{1}$$

Separate slopes were calculated for volunteering (`disc_slope_vol`) and blood donation (`disc_slope_bld`).

2.5 Statistical Analysis

2.5.1 Software and Environment

All analyses were conducted using Python 3.11 with the following packages: `pandas` 2.0 for data manipulation, `numpy` 1.24 for numerical operations, `scipy` 1.11 for statistical tests, `statsmodels` 0.14 for regression models, `matplotlib` 3.7 and `seaborn` 0.12 for visualization. Analysis scripts are available at [repository URL].

2.5.2 Hypothesis Testing Approach

H1: Timing Preferences by Donor Status. Chi-square tests of independence assessed the association between blood donor status (3 levels) and timing preference (3 levels). Effect sizes were quantified using Cramér's V, with values of 0.10, 0.30, and 0.50 interpreted as small, medium, and large effects (Cohen, 1988). To decompose effects, hurdle models were estimated in two parts: (a) logistic regression predicting willingness to donate (any vs. not at all), and (b) logistic regression predicting earlier vs. later timing among those willing to donate.

H2: WTA by Donor Status. Ordinary least squares (OLS) regression was used to predict WTA from donor status and framing condition. Given censoring at £0 and £50

(≈35% of observations), OLS provides a conservative approximation to Tobit regression (Wooldridge, 2010). Robustness was assessed using Mann-Whitney U tests, which are robust to censoring.

H3: Volunteering Timing Preference. One-sided binomial tests assessed whether the proportion preferring earlier appointments exceeded 50% (chance level). Wilson score confidence intervals were computed for proportions (Wilson, 1927). Two-proportion z-tests compared 1-month and 6-month horizons, with Cohen's h as the effect size for proportions.

H4–H5: Warm Glow and EA Effects. Logistic regression models predicted earlier timing preference among willing volunteers, with warm glow measures (H4) and EA measures (H5) as focal predictors, controlling for demographics and monetary patience. Odds ratios (OR) with 95% confidence intervals were reported. OR < 1 indicates preference for later timing.

H6: Source Framing Effects. Mann-Whitney U tests (one-tailed, Charity $<$ Research) compared WTA between framing conditions. Cohen's d quantified effect sizes, computed using pooled standard deviations.

Exploratory Analyses. Spearman rank correlations assessed cross-domain associations between discount slopes (E1). Paired t-tests and Wilcoxon signed-rank tests compared WTA under financial versus lives-saved framing within subjects (E2).

2.5.3 Significance Thresholds

All tests used $\alpha = .05$ (two-tailed) unless otherwise specified. Given the pre-registered nature of primary hypotheses (H1–H3), no correction for multiple comparisons was applied to these tests. Secondary hypotheses (H4–H6) and exploratory analyses (E1–E2) are interpreted with appropriate caution regarding multiplicity.

3 Results

3.1 Sample and Descriptive Statistics

Table 2 presents sample characteristics by experimental condition. The final sample ($N = 361$) had a mean age of 43.5 years (SD = 13.5). Regarding blood donation history, 212 participants (58.7%) were non-donors, 48 (13.3%) were lapsed donors, and 75 (20.8%) were current donors. The remaining participants did not provide blood donation history.

Randomization to framing conditions was successful. Participants in the Charity pays ($n = 181$) and Research pays ($n = 180$) conditions did not differ significantly on age ($t = 0.43$, $p = .670$), blood donor status ($\chi^2 = 0.45$, $p = .800$), Falk patience scores ($t = -0.87$, $p = .387$), warm glow preference ($\chi^2 = 1.01$, $p = .315$), or effective altruism preference ($\chi^2 = 1.84$, $p = .176$). All balance tests yielded $p > .17$, confirming successful randomization.

Regarding timing preferences, the majority of participants chose to donate or volunteer rather than decline. For blood donation, 8.6% (1-month horizon) to 9.1% (6-month horizon) selected "Not at all." For volunteering, similar rates of non-participation were observed. This high willingness to participate enabled robust analysis of timing preferences among those willing to donate or volunteer.

3.2 Primary Hypotheses

3.2.1 H1: Blood Donation Timing Preferences by Donor Status

Hypothesis 1 predicted that blood donor status would predict timing preferences, with current and lapsed donors showing stronger preferences for earlier appointments than non-donors. This hypothesis was supported.

Figure 1 displays the distribution of timing preferences by donor status. For the 1-month horizon, the association between donor status and timing preference was significant: $\chi^2(4) = 43.46$, $p < .001$, Cramér's $V = 0.255$, indicating a medium-to-large effect. Current donors showed strong preferences for earlier appointments (74.7% earlier, 20.0% later, 5.3% not at all), as did lapsed donors (93.8% earlier, 6.2% later, 0% not at all). Non-donors were more evenly distributed (55.7% earlier, 13.2% later, 31.1% not at all).

Results were similar for the 6-month horizon: $\chi^2(4) = 41.73$, $p < .001$, Cramér's $V = 0.250$. Current donors showed 82.7% preferring earlier appointments, lapsed donors showed 95.8%, and non-donors showed 58.5%.

Table 3 presents the full contingency table results. Hurdle models decomposed these effects into two components. Part A (willingness to donate) revealed that current donors were significantly more likely to donate than non-donors (OR = 8.02, $p < .001$). Part B (timing among those willing) showed that lapsed donors were more likely than non-donors to prefer earlier timing (OR = 3.56, $p = .045$ for the 1-month horizon), while current donors did not differ significantly from non-donors on timing conditional on willingness (OR = 0.89, $p = .735$).

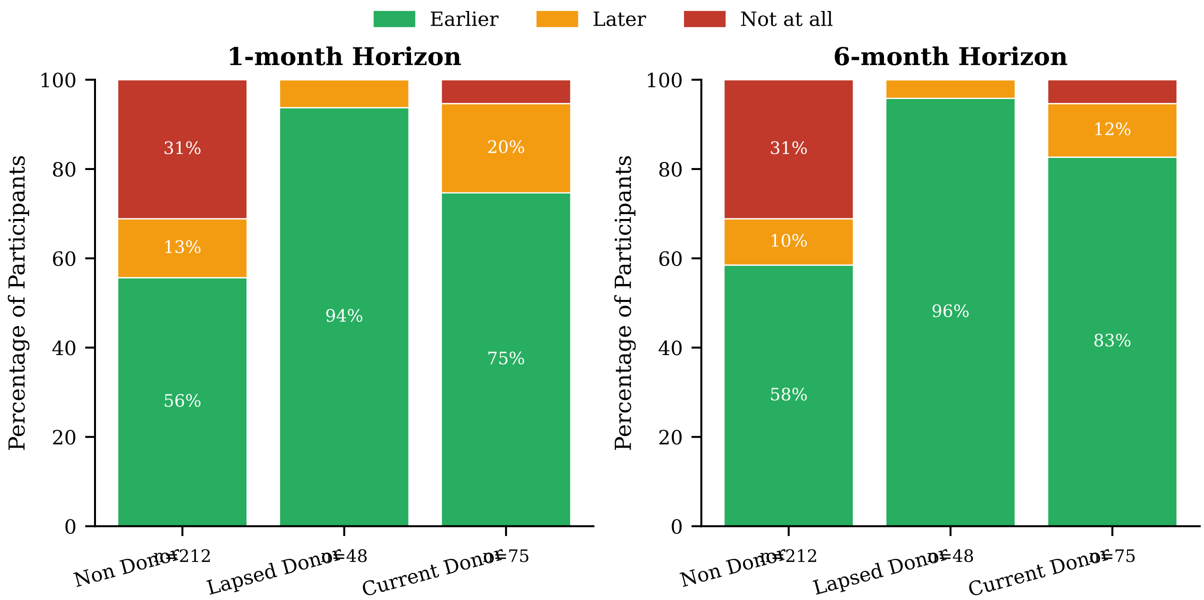

Figure 1: Blood donation timing preferences by donor status. Stacked bars show percentage choosing earlier appointment (green), later appointment (amber), or declining to donate (red) for 1-month and 6-month horizons. Sample sizes shown below each bar.

3.2.2 H2: WTA Compensation by Donor Status

Hypothesis 2 predicted that current donors would require less compensation to reschedule appointments than non-donors. This hypothesis was partially supported.

Figure 2 displays mean WTA by donor status and framing condition. Table 4 presents regression results. For the 1-month horizon ($N = 279$), OLS regression revealed that current donors required £6.42 less compensation than non-donors ($\beta = -6.42$, SE = 2.50, 95% CI [$-11.35, -1.50$], $p = .011$). Lapsed donors showed a non-significant reduction ($\beta = -2.58$, SE = 2.92, $p = .378$). The model explained 6.8% of variance in WTA ($R^2 = .068$).

For the 6-month horizon ($N = 270$), the pattern was similar but the current donor effect was marginally significant ($\beta = -4.41$, SE = 2.59, $p = .090$). The model explained 5.9% of variance ($R^2 = .059$).

Across both horizons, framing condition significantly predicted WTA. Participants in the Research pays condition required £7.32 more compensation than those in the Charity pays condition at the 1-month horizon ($p < .001$) and £7.76 more at the 6-month horizon ($p < .001$). This framing effect is examined in detail under H6.

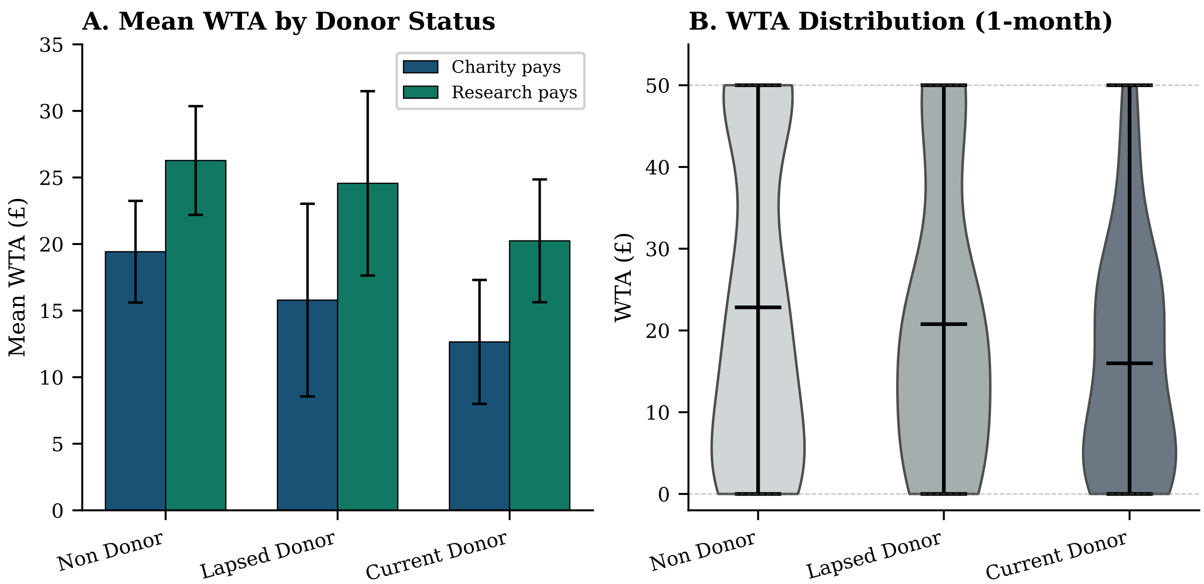

Figure 2: Willingness-to-accept (WTA) compensation by donor status. (A) Mean WTA with 95% CI by donor status and framing condition. (B) Distribution of WTA responses for the 1-month horizon. Dashed lines indicate censoring bounds at £0 and £50.

3.2.3 H3: Volunteering Timing Preferences

Hypothesis 3 predicted that participants would prefer earlier volunteering appointments at rates exceeding chance (50%). This hypothesis was strongly supported.

Figure 3 displays volunteering timing preferences. For the 1-month horizon, 261 of 361 participants (72.3%) preferred earlier appointments, 69 (19.1%) preferred later appointments, and 31 (8.6%) declined to volunteer. The binomial test against 50% was highly significant ($p < .001$), with a 95% Wilson confidence interval of [67.5%, 76.7%].

For the 6-month horizon, 278 of 361 participants (77.0%) preferred earlier appointments, 50 (13.9%) preferred later, and 33 (9.1%) declined. The binomial test was again significant ($p < .001$), 95% CI [72.4%, 81.1%].

The 4.7 percentage point difference between horizons was not statistically significant (two-proportion $z = -1.45$, $p = .146$). Cohen's $h = -0.108$ indicated a negligible effect size, suggesting that the preference for earlier timing was consistent across time horizons.

Table 5 presents the full results.

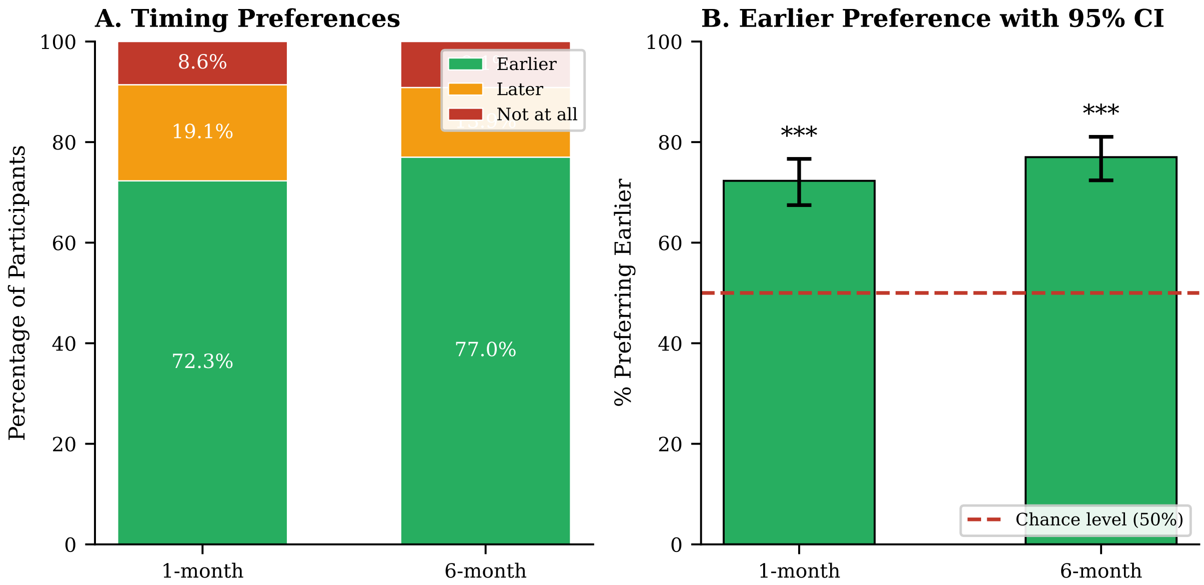

Figure 3: Volunteering timing preferences. (A) Distribution of timing choices by horizon. (B) Percentage preferring earlier appointments with 95% Wilson confidence intervals. Dashed line indicates chance level (50%). $^{***}p < .001$ for binomial test.

3.3 Secondary Hypotheses

3.3.1 H4–H5: Warm Glow and Effective Altruism Effects

Hypothesis 4 predicted that warm glow motivation would predict preference for later timing, while Hypothesis 5 predicted that effective altruism orientation would predict preference for earlier timing. H4 was supported; H5 was not supported.

Table 6 and Figure 4 present logistic regression results predicting earlier timing preference among those willing to volunteer (Part B of hurdle model).

For warm glow preference (H4), participants high in warm glow were significantly less likely to choose earlier appointments. At the 1-month horizon, the odds ratio was 0.40 (95% CI [0.20, 0.79], $p = .008$), indicating that warm glow preference was associated with 60% lower odds of choosing earlier timing. At the 6-month horizon, the effect was similar (OR = 0.53, 95% CI [0.26, 1.10], $p = .090$), though marginally significant. The behavioral warm glow measure (`wg_z`) did not significantly predict timing ($p > .75$).

For effective altruism (H5), contrary to predictions, EA preference did not significantly predict earlier timing. At the 1-month horizon, the odds ratio was 0.62 (95% CI [0.29, 1.33], $p = .218$), and at the 6-month horizon, OR = 1.08 (95% CI [0.45, 2.55], $p = .869$). Neither the attitudinal nor behavioral EA measures showed significant effects in the predicted direction.

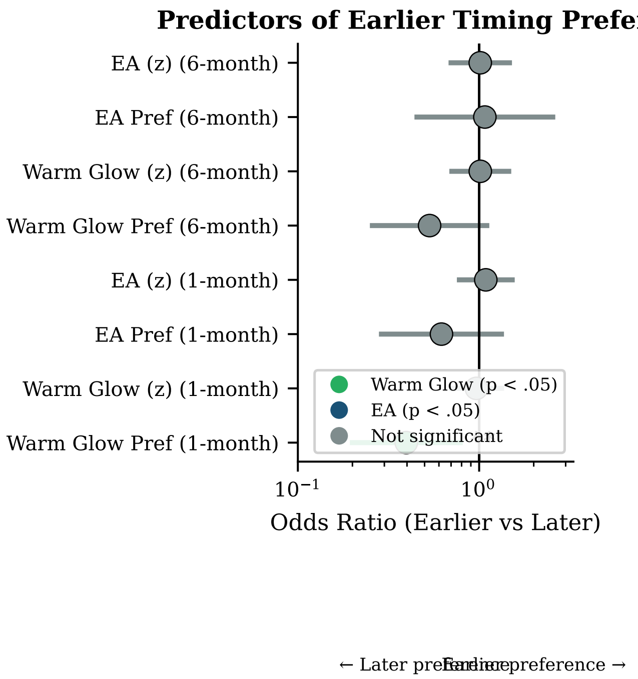

Figure 4: Forest plot of warm glow and effective altruism effects on timing preference. Points show odds ratios with 95% confidence intervals from logistic regression (Part B of hurdle model). OR < 1 indicates preference for later timing. Colored points indicate $p < .05$.

3.3.2 H6: Source Framing Effects on WTA

Hypothesis 6 predicted that charity-funded framing would reduce WTA compared to research-funded framing. This hypothesis was strongly supported.

Figure 5 and Table 7 present framing effects across all domains and horizons. The framing manipulation produced consistent, large effects:

- **Volunteering, 1-month**: Charity pays $M = £14.61$ (SD = 16.84) vs. Research pays $M = £23.89$ (SD = 17.25); difference = £9.29, Cohen's $d = 0.54$, $p < .001$
- **Volunteering, 6-month**: Charity pays $M = £15.96$ (SD = 17.88) vs. Research pays $M = £28.47$ (SD = 17.58); difference = £12.52, Cohen's $d = 0.71$, $p < .001$
- **Blood donation, 1-month**: Charity pays $M = £16.15$ (SD = 16.76) vs. Research pays $M = £25.06$ (SD = 17.67); difference = £8.91, Cohen's $d = 0.52$, $p < .001$
- **Blood donation, 6-month**: Charity pays $M = £18.26$ (SD = 17.60) vs. Research pays $M = £27.42$ (SD = 17.67); difference = £9.16, Cohen's $d = 0.52$, $p < .001$

Effect sizes ranged from $d = 0.52$ to $d = 0.71$, representing medium-to-large effects. The framing effect was consistent across both prosocial domains and both time horizons.

3.4 Exploratory Analyses

3.4.1 E1: Cross-Domain Correlation of Discount Slopes

Exploratory analysis E1 examined whether temporal discount slopes were correlated across prosocial domains and with monetary patience. Figure 6 displays the scatterplot of volunteering versus blood donation discount slopes.

Volunteering and blood donation discount slopes showed a weak but significant positive correlation (Spearman's $\rho = 0.224$, $p < .001$, $N = 258$). This indicates modest consistency in temporal preferences across prosocial domains.

Neither prosocial domain showed significant correlation with the Falk monetary patience measure. The volunteering discount slope was not significantly correlated with

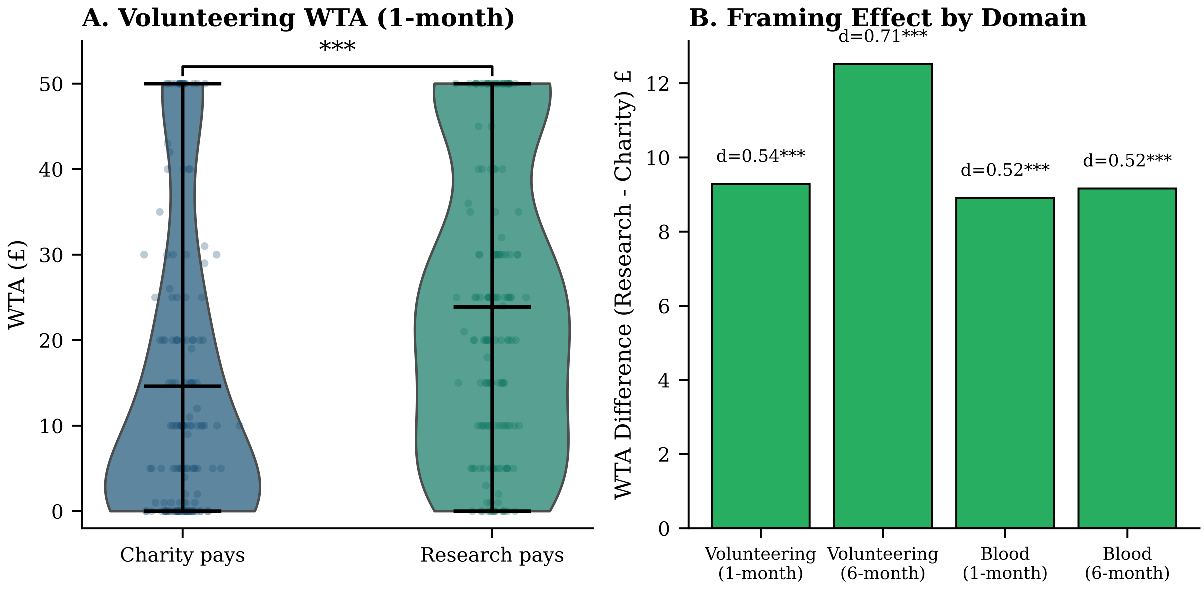

Figure 5: Source framing effects on WTA. (A) Distribution of WTA for volunteering (1-month) by framing condition, with individual data points and violin plots. (B) Mean WTA difference (Research − Charity) across domains with Cohen's d effect sizes. $^{***}p < .001$.

Falk patience ($\rho = 0.089$, $p = .121$, $N = 303$), nor was the blood donation discount slope ($\rho = 0.051$, $p = .388$, $N = 285$).

Table 8 presents the full correlation matrix.

3.4.2 E2: Lives-Saved versus Financial Framing

Exploratory analysis E2 compared WTA under financial versus lives-saved framing within participants. Figure 7 displays the within-person comparison.

Among participants who chose earlier appointments at the 6-month horizon ($N = 221$), mean WTA was significantly lower under lives-saved framing ($M = £10.01$, SD = 15.27) compared to financial framing ($M = £18.87$, SD = 16.88). The paired t-test was significant: $t(220) = 7.53$, $p < .001$, with a medium effect size (Cohen's $d = 0.51$).

Among participants who chose later appointments ($N = 31$), the pattern was similar: financial framing $M = £25.48$ versus lives-saved framing $M = £16.48$; $t(30) = 2.79$, $p = .009$, $d = 0.50$.

Overall, 58.4% of participants showed lower WTA under lives-saved framing, 24.4% showed no difference, and 17.2% showed higher WTA under lives-saved framing.

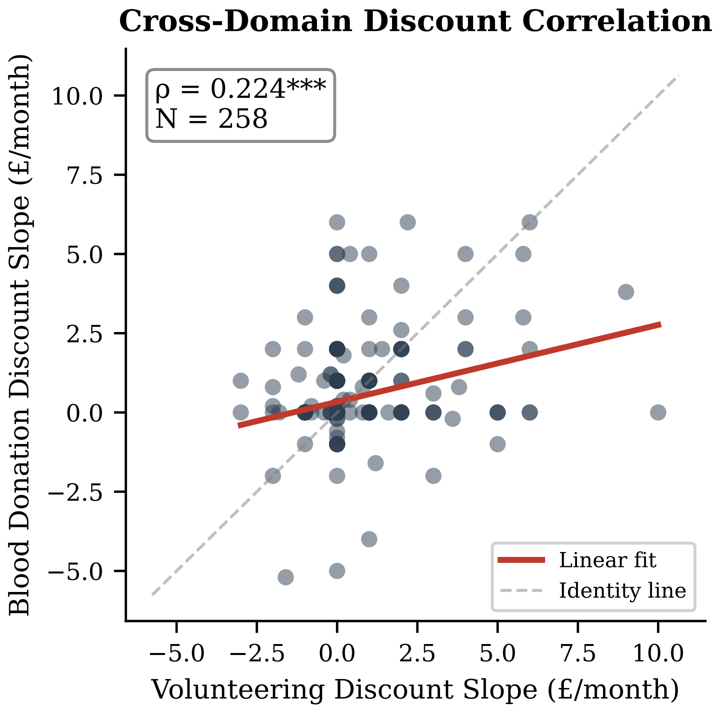

Figure 6: Cross-domain correlation of temporal discount slopes. Each point represents one participant. Solid line shows linear fit; dashed line shows identity. Spearman's ρ indicates weak positive correlation between volunteering and blood donation discount parameters.

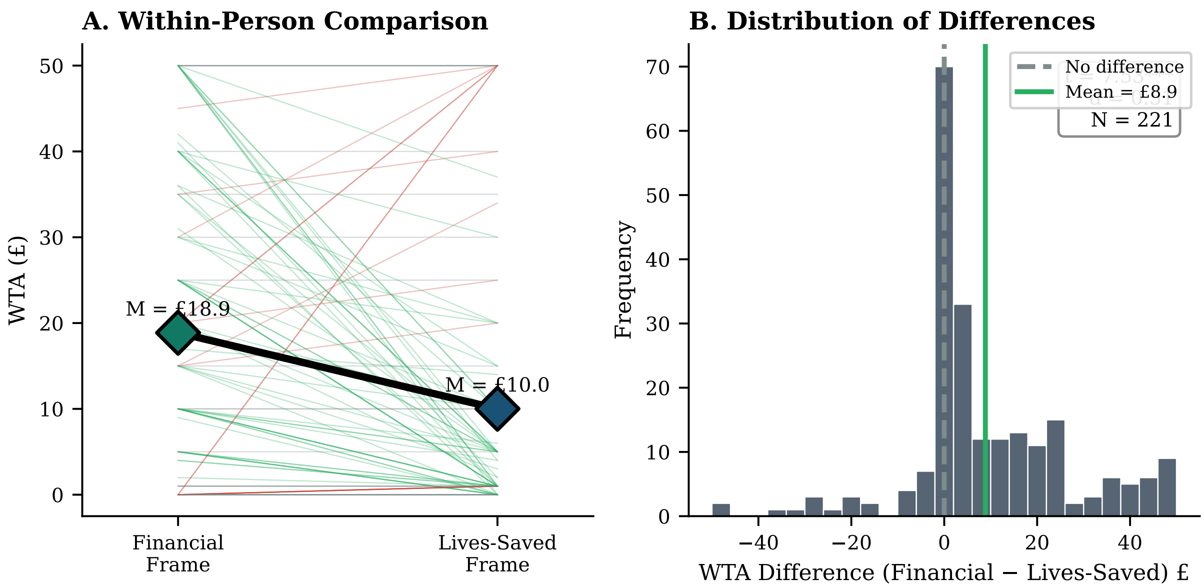

Figure 7: Within-person comparison of lives-saved versus financial framing. (A) Lines connect individual participants' WTA under both frames (subset shown for clarity); diamonds indicate means. (B) Distribution of within-person WTA differences. Positive values indicate lower WTA under lives-saved framing. $^{***}p < .001$ paired t-test.

3.5 Summary of Hypothesis Tests

Table 1 summarizes the results of all hypothesis tests. Of the six pre-registered hypotheses, four were supported (H1, H3, H4, H6), one was partially supported (H2), and one was not supported (H5). Both exploratory analyses yielded significant findings.

Table 1: Summary of hypothesis test results.

Hypothesis	Prediction	Key Result	Outcome
H1	Donor status → timing	$\chi^2 = 43.46$, $V = 0.26$	Supported
H2	Donor status → lower WTA	$\beta = -6.42$, $p = .011$	Partially supported
H3	Earlier preference > 50%	72–77%, $p < .001$	Supported
H4	Warm glow → later	OR = 0.40, $p = .008$	Supported
H5	EA → earlier	OR = 0.62, $p = .218$	Not supported
H6	Charity frame → lower WTA	$d = 0.52$–0.71, $p < .001$	Supported
E1	Cross-domain correlation	$\rho = 0.22$, $p < .001$	Significant
E2	Lives-saved → lower WTA	$d = 0.51$, $p < .001$	Significant

4 Discussion

4.1 Summary of Key Findings

This study examined temporal preferences for prosocial behaviors—what we term "intertemporal altruism"—addressing the question of whether people discount future charitable acts similarly to how they discount future monetary rewards. Our findings reveal a striking and consistent pattern: people prefer to help sooner rather than later. Across both blood donation and volunteering contexts, and across both 1-month and 6-month time horizons, the majority of participants (72–77%) preferred earlier appointments. This preference was particularly pronounced among experienced blood donors, with current and lapsed donors showing rates of 75–96% preferring earlier timing.

Beyond this primary finding, four additional results merit emphasis. First, blood donor status robustly predicted both willingness to donate and timing preferences (H_1), with current donors showing eight-fold higher odds of donation willingness compared to non-donors. Second, donor experience was associated with lower compensation demands (H_2), with current donors requiring approximately £6 less to reschedule than non-donors.

Third, warm glow motivation—but not effective altruism orientation—predicted timing preferences (H_4, H_5), with high warm glow individuals showing 60% lower odds of preferring earlier appointments. Fourth, framing compensation as charity-funded versus research-funded substantially reduced willingness-to-accept (H_6), with medium-to-large effect sizes ($d = 0.52$–0.71) across all domains.

4.2 Interpretation

4.2.1 Negative Discounting of Prosocial Behavior

The most theoretically significant finding is the strong preference for earlier prosocial action, which stands in marked contrast to the robust positive discounting typically observed for monetary rewards (Frederick et al., 2002). When people can receive \$100 today or \$110 in a month, most choose the immediate smaller reward. Our findings suggest that the opposite pattern may hold for prosocial costs: given the choice between donating blood today or in a month, most people prefer to act now.

This pattern is consistent with "negative discounting"—valuing future actions more than equivalent present actions—previously documented primarily in the context of anticipating aversive experiences (Loewenstein, 1987). Several mechanisms may explain why prosocial behavior follows this unusual pattern. First, *immediacy bias in costs* may operate asymmetrically to benefits. While people prefer immediate benefits, the physical and time costs of blood donation or volunteering may be discounted more steeply when distant, making future prosocial commitments feel less costly at the moment of decision but equivalently costly at the moment of execution. Second, *identity-based motivation* may favor immediate action; individuals who view themselves as helpful may prefer to act on that identity promptly rather than delay, maintaining self-consistency (Akerlof and Kranton, 2000).

4.2.2 The Role of Warm Glow

The finding that warm glow motivation predicts preference for *later* rather than earlier timing supports an anticipatory utility interpretation (Loewenstein, 1987). Individuals high in warm glow may derive ongoing pleasure from having committed to help, savoring the anticipated prosocial act over an extended period. This interpretation aligns with research demonstrating that anticipated giving can activate reward circuits similarly to actual giving (Harbaugh et al., 2007), and that "savoring" future positive experiences represents a distinct source of utility (Loewenstein, 1987).

Notably, the behavioral measure of warm glow (dictator game allocations) did not predict timing, while the attitudinal measure did. This dissociation suggests that self-conscious awareness of enjoying the act of giving—rather than behavioral generosity per se—drives the preference for delayed helping. This finding has methodological implications for future research on warm glow motivation.

4.2.3 Effective Altruism: Understanding the Null Finding

Contrary to our prediction that consequentialist EA orientation would predict earlier timing (to maximize impact sooner), this relationship was not significant. This null finding warrants careful consideration. First, EA-oriented individuals may recognize that maintaining flexibility has option value; committing to a specific early date forecloses alternatives that might produce greater impact. Second, the hypothetical nature of our scenarios may have failed to engage the systematic consequentialist reasoning characteristic of EA (MacAskill, 2015a). Third, our measure of EA orientation, while face-valid, may not have captured the construct with sufficient precision.

4.2.4 Framing and Motivation Crowding

The substantial framing effect on WTA (£9–13 reduction under charity framing) provides strong evidence for motivation crowding in prosocial contexts (Frey, 1997; Gneezy et al., 2011). When compensation is framed as coming from a charity, accepting it may feel like taking resources away from beneficiaries, activating prosocial motivations that reduce WTA. In contrast, research-funded compensation carries no such prosocial cost, allowing participants to demand more without moral conflict.

This finding extends motivation crowding theory by demonstrating that framing alone—without changing the actual source or amount of compensation—can substantially shift prosocial motivation. The lives-saved framing effect (E2), which reduced WTA by an additional £9 through within-person comparison, reinforces this interpretation and suggests that making the prosocial impact salient enhances intrinsic motivation.

4.3 Implications

4.3.1 Theoretical Implications

Our findings contribute to several theoretical domains. For *intertemporal choice theory*, we provide evidence that the sign and magnitude of temporal discounting may be domain-specific, challenging unified accounts of discounting that assume a single discount rate across domains (Frederick et al., 2002). The weak correlation between prosocial and monetary discounting parameters (E1: $\rho = 0.22$) supports domain-specific rather than domain-general models.

For *prosocial motivation theory*, our results suggest that warm glow and effective altruism represent distinct motivational orientations with different temporal signatures. Warm glow, with its emphasis on the emotional experience of giving, may be enhanced by anticipation. Effective altruism, with its emphasis on outcomes, may be less sensitive to timing per se. This distinction could inform theoretical models that treat prosocial motivation as unidimensional.

For *motivation crowding theory*, we extend prior work by demonstrating framing effects in the absence of actual incentive changes. This suggests that the cognitive construal of compensation—not merely its presence—determines whether crowding occurs.

4.3.2 Practical Implications

Our findings offer actionable insights for blood collection agencies, charitable organizations, and policymakers. For *blood collection agencies*, the strong preference for earlier appointments suggests that offering immediate donation opportunities may increase uptake. Retention programs might emphasize prompt re-donation rather than distant future commitments. The framing effect suggests that any compensation programs should avoid framing that triggers crowding-out of intrinsic motivation.

For *charitable organizations*, our results suggest that people generally prefer immediate volunteer opportunities to distant commitments. While pledge drives for future giving can be effective (Breman, 2011), organizations might achieve better engagement by offering immediate opportunities with the option to continue. However, for donors high in warm glow motivation, extended commitment periods with regular communications about the upcoming contribution might sustain engagement through anticipatory utility.

For *policymakers*, the framing effect underscores that how incentives are described matters as much as their magnitude. Programs that emphasize the prosocial impact of participation (e.g., lives saved through blood donation) may achieve better engagement than those emphasizing personal compensation.

4.4 Strengths and Limitations

4.4.1 Strengths

This study has several methodological strengths. First, we employed a *pre-registered* design with clearly specified hypotheses, reducing researcher degrees of freedom and enhancing credibility of confirmatory findings. Second, we examined *multiple prosocial domains* (blood donation and volunteering) and *multiple time horizons* (1-month and 6-month), demonstrating consistency of effects across contexts. Third, we used both *attitudinal and behavioral measures* of warm glow and effective altruism, providing a more complete assessment of these constructs. Fourth, the experimental manipulation of *source framing* provides causal evidence for motivation crowding effects. Fifth, our *hurdle model approach* appropriately separated willingness to participate from timing preferences conditional on participation, avoiding confounds present in simpler analytical approaches.

4.4.2 Limitations

Several limitations should be acknowledged. First, our study used *hypothetical* scenarios rather than real donation decisions. While hypothetical methods are standard in this literature and allow controlled manipulation of time horizons, actual behavior may differ from stated intentions. The hypothetical nature may also explain the null EA finding if consequentialist reasoning is more engaged by real stakes.

Second, our *sample characteristics* may limit generalizability. Participants were recruited from Prolific (UK) and may not represent the general population or typical blood donors. The relatively high proportion of non-donors (58.7%) may have affected estimates in ways that would not replicate in donor-enriched samples.

Third, our *WTA measure was censored* at £0 and £50, with approximately 35% of observations at boundaries. While OLS regression provides reasonable approximation to Tobit models, this censoring limits precision for estimating extreme preferences.

Fourth, the *cross-sectional design* limits causal inference about the relationship between donor experience and temporal preferences. The observed associations could reflect selection effects (people with different temporal preferences self-selecting into donation) rather than experiential effects (donation experience shaping preferences).

Fifth, our *measures of psychological constructs* may have limited validity. The EA measure in particular did not predict behavior as expected, suggesting either measurement limitations or that our theoretical predictions were incorrect.

4.5 Future Directions

Several avenues for future research emerge from this work. First, *field experiments with actual donation scheduling* would test external validity. Collaborations with blood banks could examine whether laboratory-measured temporal preferences predict real appointment choices and show rates.

Second, the *mechanisms underlying negative discounting* deserve further investigation. Neuroimaging studies could examine whether anticipation of prosocial action activates different reward circuitry than anticipation of monetary gains, potentially identifying distinct neural substrates for prosocial versus monetary discounting.

Third, *cultural variation* in prosocial temporal preferences represents an important boundary condition. Our UK-based sample may not generalize to cultural contexts with different norms around helping behavior, time orientation, or individual versus collective responsibility.

Fourth, the *dissociation between prosocial and monetary temporal preferences* (E1) suggests domain-specific discounting processes. Research examining whether this dissociation reflects different underlying computational processes or different affective responses could inform theories of intertemporal choice more broadly.

Fifth, *individual differences beyond those examined here* warrant investigation. Personality factors (conscientiousness, empathy), demographic characteristics (age, socioeconomic status), and situational factors (current stress, time scarcity) may all moderate prosocial temporal preferences.

Finally, *longitudinal designs* tracking individuals across their prosocial careers could disentangle selection from experience effects, determining whether temporal preferences shape donation behavior or donation experience shapes temporal preferences—or both.

5 Conclusion

This study investigated "intertemporal altruism"—how temporal delay affects decisions to help others. Using a pre-registered experimental design with 361 UK adults, we examined timing preferences for blood donation and volunteering across 1-month and 6-month horizons, and measured willingness-to-accept compensation for schedule changes under different framing conditions. Our goal was to determine whether the robust positive discounting observed for monetary rewards extends to prosocial behavior, or whether helping others follows a different temporal logic.

The findings are clear: people prefer to help sooner rather than later. Across both prosocial domains and both time horizons, 72–77% of participants chose earlier appointments over later ones. This preference was especially pronounced among experienced blood donors, with current and lapsed donors showing 75–96% earlier preferences. Beyond timing, we found that donor experience predicted lower compensation demands, warm glow motivation predicted preference for delayed (rather than immediate) helping, and framing compensation as charity-funded reduced willingness-to-accept by £9–13 compared to research-funded framing. Effective altruism orientation, contrary to predictions, did not significantly predict timing preferences.

The key contribution of this work is demonstrating that temporal preferences for prosocial behavior differ qualitatively from monetary discounting. While people typically discount future rewards—preferring \$100 today over \$110 next month—they show the opposite pattern for prosocial costs, preferring to donate blood or volunteer now rather than later. This "negative discounting" of prosocial behavior, combined with the weak correlation between prosocial and monetary discount parameters ($\rho = 0.22$), challenges unified theories of intertemporal choice and suggests domain-specific processes govern temporal preferences.

These findings carry broader significance for theory and practice. Theoretically, they invite integration of prosocial motivation research with intertemporal choice theory, opening new questions about why helping others follows different temporal dynamics than helping oneself. Practically, they offer guidance for blood banks, charitable organizations, and policymakers: people are generally eager to help now, and how opportunities and incentives are framed substantially affects engagement.

Ultimately, this research reveals an optimistic truth about human nature. When given the choice of when to help, most people choose sooner. Understanding the psychology behind this preference—and how to harness it—represents a promising frontier for promoting prosocial behavior in an era when collective action is increasingly vital.

Tables

Table 2: Sample characteristics by experimental condition.

Variable	Total	Charity Pays	Research Pays	Test
N	361	185	176	
Age, M (SD)	43.5 (13.5)	43.8 (14.0)	43.2 (13.0)	t = 0.43, p = 0.670
Female, %	0.0	0.0	0.0	χ^2 = 1.21, p = 0.546
Blood Donor Status, %				
Non Donor	58.7	56.8	60.8	
Lapsed Donor	13.3	11.9	14.8	
Current Donor	20.8	21.1	20.5	χ^2 = 0.45, p = 0.800
Falk Patience, M (SD)	14.86 (7.15)	14.54 (7.38)	15.19 (6.90)	t = -0.87, p = 0.387
Warm Glow Preference, %	40.4	43.2	37.5	χ^2 = 1.01, p = 0.315
EA Preference, %	27.1	23.8	30.7	χ^2 = 1.84, p = 0.176

Note: Tests compare Charity Pays vs Research Pays conditions. * p < .05, ** p < .01, *** p < .001.

Table 3: Distribution of timing preferences by blood donor status and time horizon.

Horizon	Donor Status	Earlier %	Later %	Not at all %	χ^2	V	p
1-month	Non Donor	55.7	13.2	31.1			
	Lapsed Donor	93.8	6.2	0.0			
	Current Donor	74.7	20.0	5.3	43.46	0.255	< .001
6-month	Non Donor	58.5	10.4	31.1			
	Lapsed Donor	95.8	4.2	0.0			
	Current Donor	82.7	12.0	5.3	41.73	0.250	< .001

Note: χ^2 = chi-square statistic; V = Cramer's V effect size. Earlier = prefer 1-week appointment; Later = prefer delayed appointment.

Table 4: OLS regression predicting willingness-to-accept (WTA) compensation for rescheduling blood donation.

Horizon	Predictor	β	SE	95% CI	p
1-month	Intercept (Non-Donor, Charity)	19.19	1.68	[15.89, 22.49]	$<$ .001
	Lapsed Donor	-2.58	2.92	[-8.32, 3.17]	0.378
	Current Donor	-6.42	2.50	[-11.35, -1.50]	0.011*
	Research Frame	7.32	2.07	[3.25, 11.40]	$<$ .001***
	Model fit: $R^2 = 0.068$, N = 279				
6-month	Intercept (Non-Donor, Charity)	20.70	1.73	[17.29, 24.11]	$<$ .001
	Lapsed Donor	-2.91	3.15	[-9.12, 3.29]	0.356
	Current Donor	-4.41	2.59	[-9.52, 0.70]	0.090
	Research Frame	7.76	2.16	[3.51, 12.02]	$<$ .001***
	Model fit: $R^2 = 0.059$, N = 270				

Note: Reference category is Non-Donor with Charity-funded framing. β coefficients represent change in WTA (£). * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 5: Distribution of volunteering timing preferences with binomial test results.

Horizon	N	Earlier	Later	Not at all	95% CI	p (vs 50%)
1-month	361	261 (72.3%)	69 (19.1%)	31 (8.6%)	[67.5%, 76.7%]	$<$ .001***
6-month	361	278 (77.0%)	50 (13.9%)	33 (9.1%)	[72.4%, 81.1%]	$<$ .001***
Comparison		$\Delta = 4.7$ pp			h = -0.108	0.146

Note: p-values from one-sided binomial test against null hypothesis of 50%. h = Cohen's h effect size for proportion comparison. pp = percentage points.

Table 6: Logistic regression predicting earlier timing preference among those willing to volunteer (Part B of hurdle model).

Horizon	Predictor	OR	95% CI	p
1-month	WG Preference	0.40	[0.20, 0.79]	0.008**
	WG (z-scored)	0.96	[0.70, 1.33]	0.827
	EA Preference	0.62	[0.29, 1.33]	0.218
	EA (z-scored)	1.09	[0.78, 1.52]	0.622
	N = 330, Pseudo-$R^2 = 0.028$			
6-month	WG Preference	0.53	[0.26, 1.10]	0.090
	WG (z-scored)	1.01	[0.71, 1.46]	0.937
	EA Preference	1.08	[0.45, 2.55]	0.869
	EA (z-scored)	1.01	[0.70, 1.47]	0.941
	N = 328, Pseudo-$R^2 = 0.019$			

Note: OR = odds ratio. OR $<$ 1 indicates preference for later timing. Controls include Falk patience and age. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 7: Comparison of WTA between charity-funded and research-funded framing conditions.

Domain	Charity M (SD)	Research M (SD)	Diff	Cohen's d	p
Volunteering (1-month)	£14.61 (16.84)	£23.89 (17.25)	£9.29	0.54	$<$ .001***
Volunteering (6-month)	£15.96 (17.88)	£28.47 (17.58)	£12.52	0.71	$<$ .001***
Blood (1-month)	£16.15 (16.76)	£25.06 (17.67)	£8.91	0.52	$<$ .001***
Blood (6-month)	£18.26 (17.60)	£27.42 (17.67)	£9.16	0.52	$<$ .001***

Note: M = mean, SD = standard deviation. Diff = Research - Charity. p-values from Mann-Whitney U test (one-tailed). * p < .05, ** p < .01, *** p < .001.

Table 8: Summary of exploratory analyses: cross-domain correlations (E1) and lives-saved framing comparison (E2).

Analysis	Comparison	Statistic	Effect S
E1: Cross-Domain Correlations			
	Volunteering ↔ Blood discount	$\rho = 0.224$	weak
	Volunteering discount ↔ Falk	$\rho = 0.089$	weak
E2: Lives-Saved vs Financial Framing			
	Financial - Lives-saved (Earlier choosers)	M diff = £8.86	d = 0.5
	% with lower WTA under lives-saved	58.4%	

Note: ρ = Spearman correlation. d = Cohen's d (paired). * p < .05, ** p < .01, *** p < .001.

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