After Silent Spring: Altruistic Legacies of Herbicidal Warfare in Vietnam

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Outline

Introduction

Experiment Design

Results

Conclusion

Introduction

War Fosters Altruism, How and Why?

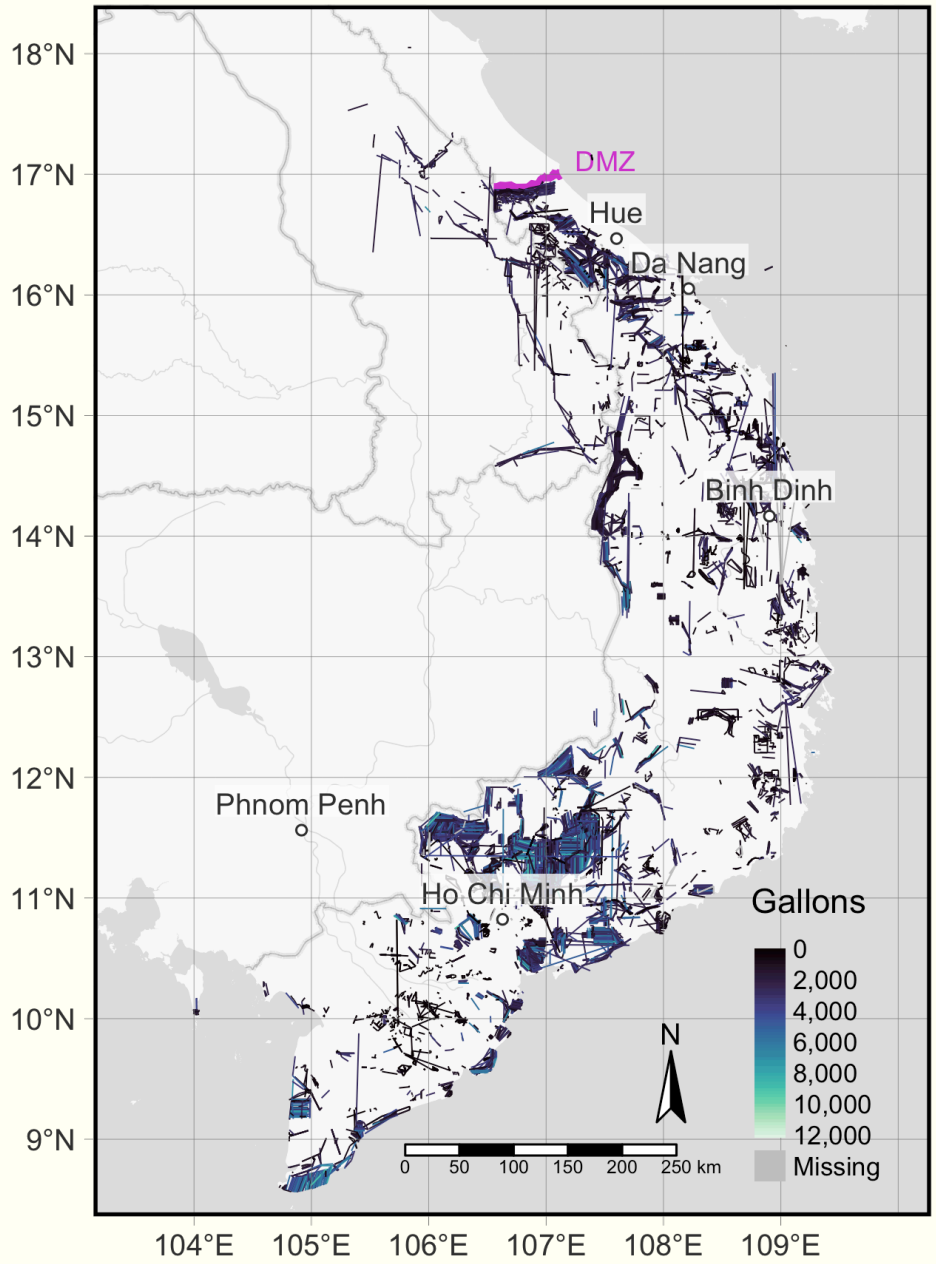
- Exposure to **political violence** fosters **altruism** and prosocial behavior (e.g., Bauer et al., 2016, 2014; Bellows & Miguel, 2006, 2009; Blattman, 2009; Dinas et al., 2021; Lindsey & Koos, 2024; Lupu & Peisakhin, 2017; Wayne & Zhukov, 2022)
  - both direct (e.g., survivors) and indirect (e.g., descendants)
- New insights from **a lab-in-the-field experiment** in Da Nang, Vietnam (pilot experiment, $N = 30$)
  1. **"My pain"** effect: Herbicide **victims** behave **altruistic**
  2. **"Your pain"** effect: **Non**-victims behave altruistic **toward** victims

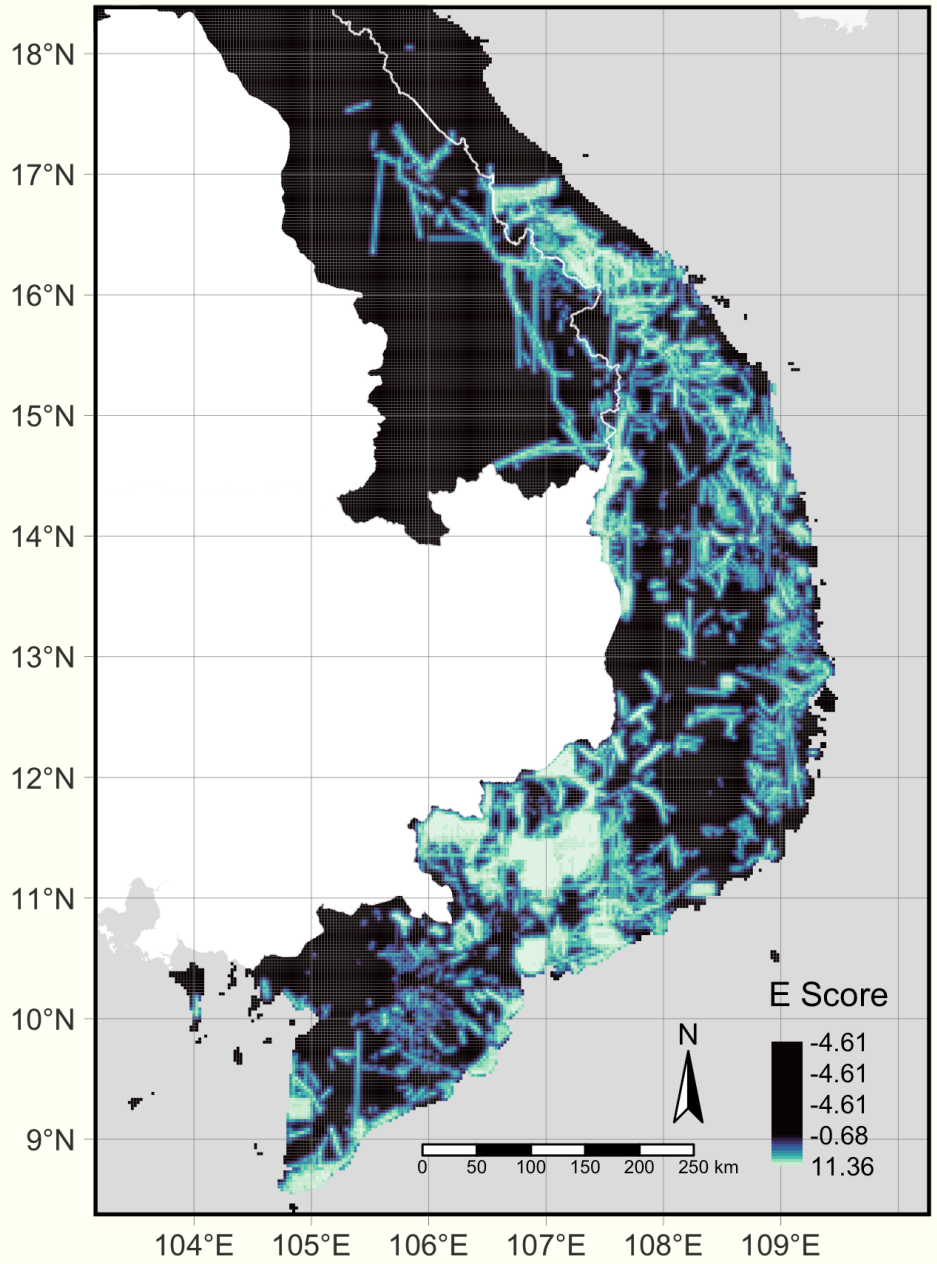
Experiment Design

Sample

- **"Hard-to-reach"** population: Herbicide (most notably AO) victims and their families/descendants
  - We are somehow (officially) granted access to the herbicide victims (households) in Da Nang
  - Two major US air bases for Operation Ranch Hand (1962–71): Bien Hoa (near Ho Chi Minh City) and Da Nang
- **Sample**: 15 households (each) **with/without** herbicide victim(s) (30 in total) in Hoa Hai (commune), Da Nang (district) (cf. Torgerson & Torgerson, 2008, Chap.12)
  - based on the official victim records ($15/76 = 19.7\%$) $\rightsquigarrow$ (partly) addressing measurement error
  - Face-to-face (online is infeasible), Aug 29–Sep 2, 2023
  - We ended up with a sample of **28(/30) households** (respondents) due to errors in the field

Herbicide Exposure





Study Area


THÀNH PHỐ ĐÀ NẴNG
THỪA THIÊN - HUẾ
QUẢNG NAM
HÒA VANG
Q. LIÊN CHIỂU
Q. THANH KHÊ
Q. HẢI CHÂU
Q. SƠN TRÀ
Q. NGŨ HÀNH SƠN
Q. CẨM LỆ
PHÚ LỘC
NAM ĐÔNG
ĐÔNG GIANG
ĐẠI LỘC
ĐIỆN BÀN
VỊNH ĐÀ NẴNG
BIỂN ĐÔNG
BÁN ĐẢO SƠN TRÀ
TP. ĐÀ NẴNG Tỷ lệ : 125 000
HUYỆN ĐẢO HOÀNG SA Tỷ lệ 1:5 000 000
CÁC ĐƠN VỊ HÀNH CHÍNH ĐƯỢC ĐÁNH SỐ TRÊN BẢN ĐỒ
TP. Đà Nẵng
1 An Hải Đông
2 An Hải Tây
3 Bình Hiên
4 Bình Thuận
5 Chính Gián
6 Hải Châu I
7 Hải Châu II
8 Nam Dương
9 Phước Ninh
10 Tam Thuận
11 Tân Chính
12 Thạc Gián
13 Thạch Thang
14 Thanh Bình
15 Thanh Khê Tây
16 Thuận Phước
17 Vĩnh Trung
18 Xuân Hà
19 Hòa Thuận Đông
TT | ĐƠN VỊ HÀNH CHÍNH | DIỆN TÍCH (Km²) | DÂN SỐ (Người) | MẬT ĐỘ (Người/km²)
1 | Q. Cẩm Lệ | 33,3 | 71 400 | 2 144
2 | Q. Hải Châu | 20,6 | 198 800 | 9 650
3 | Q. Liên Chiểu | 83,1 | 72 800 | 876
4 | Q. Ngũ Hành Sơn | 36,5 | 50 500 | 1 384
5 | Q. Sơn Trà | 60,8 | 112 600 | 1 852
6 | Q. Thanh Khê | 9,3 | 160 900 | 17 301
7 | H. Hòa Vang | 707,3 | 106 800 | 151
8 | H. Hoàng Sa | 305,0 | | |
Toàn tỉnh | 1 255,9 | 773 800 | 616
47

Experimental Measurements

Behavioral Outcome

- **Dictator (sharing) game** (next slide) ⇝ today's talk

Attitudinal Outcome

- Government/party support ⇝ ⃠ **NOT** approved
- Institutional/interpersonal trust ⇝ ⃠ **NOT** approved
  - both direct questioning and indirect approaches (e.g., crosswise model, endorsement and list experiments)

Demographic Variables, etc.

- Covariates: Household and respondent attributes (education, gender, income, etc., Appendix slides)
- Other outcomes: Social and political organization membership/leadership (not reported here)

Treatment and Outcome

Outcome: Sharing in Dictator Game

- Respondents receive VND 80K ~ a half-day wage
  - Minimum hourly wage in Vietnam ~ VND 20K ~ USD 0.8
- decide how to **share** ("donate") the VND 80K with an anonymous **recipient** with an increment of 10K (0–80K)

Randomized Treatments

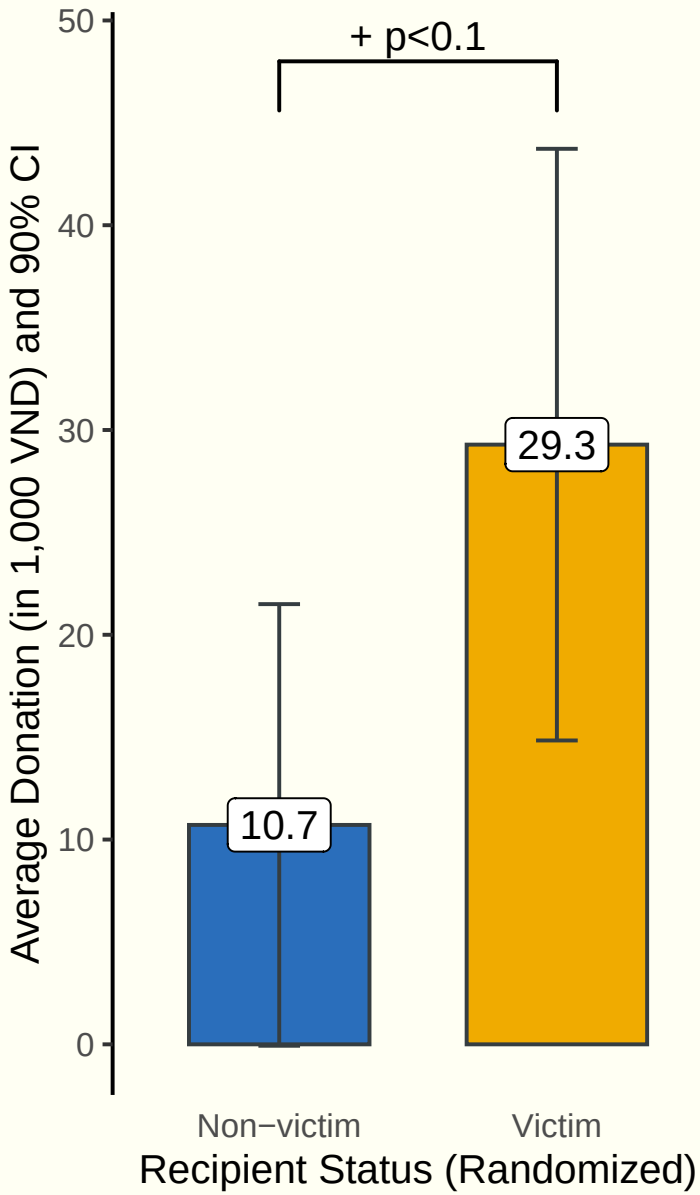
1. **Recipient status**: An anonymous household **[with herbicide victim(s)]** ⇝ **"your pain"**
2. Decision timing: Dictator game at the [beginning/end] of the herbicide-related survey ⇝ information stimulus

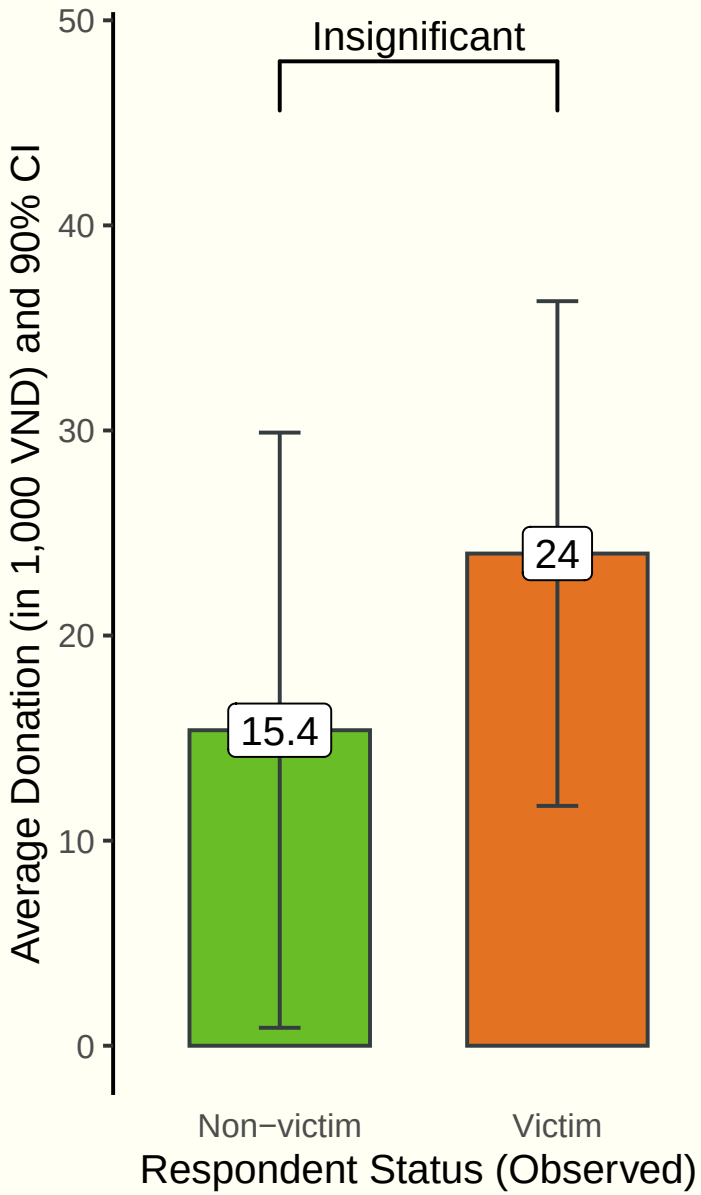
Herbicide Victim Status (Observed)

- **Respondent status**: With 1+ victims or not ⇝ **"my pain"**
- mimicking the key variable in previous studies

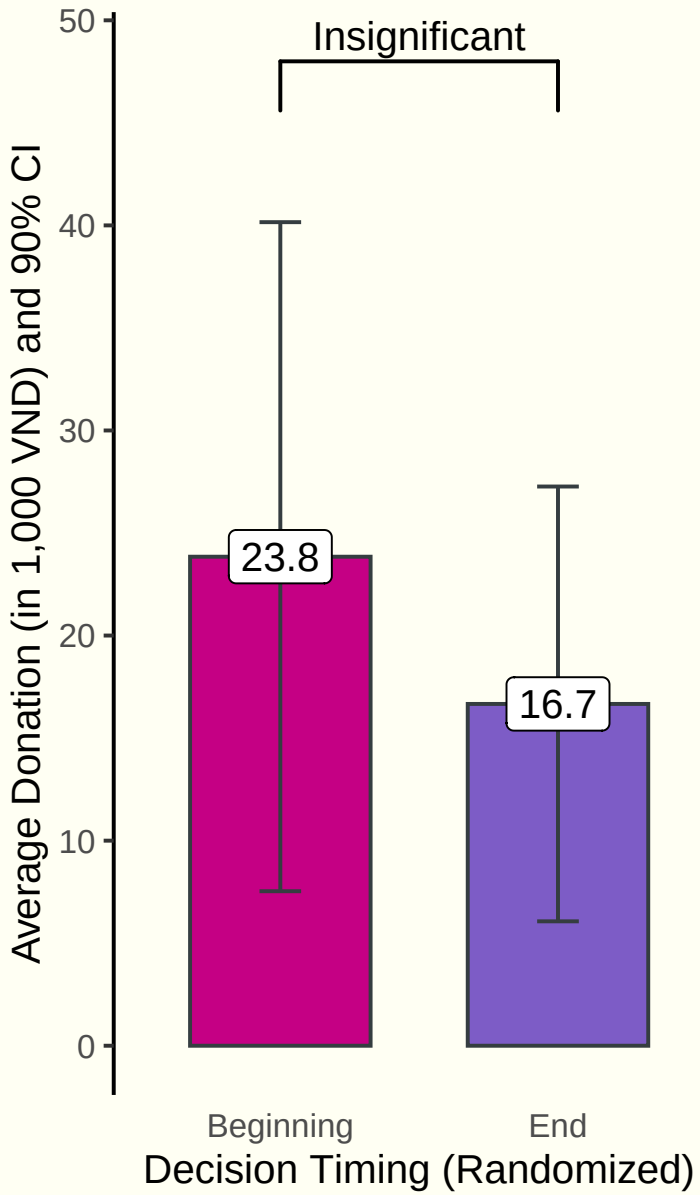
Results

Naïve Difference





Naïve Difference



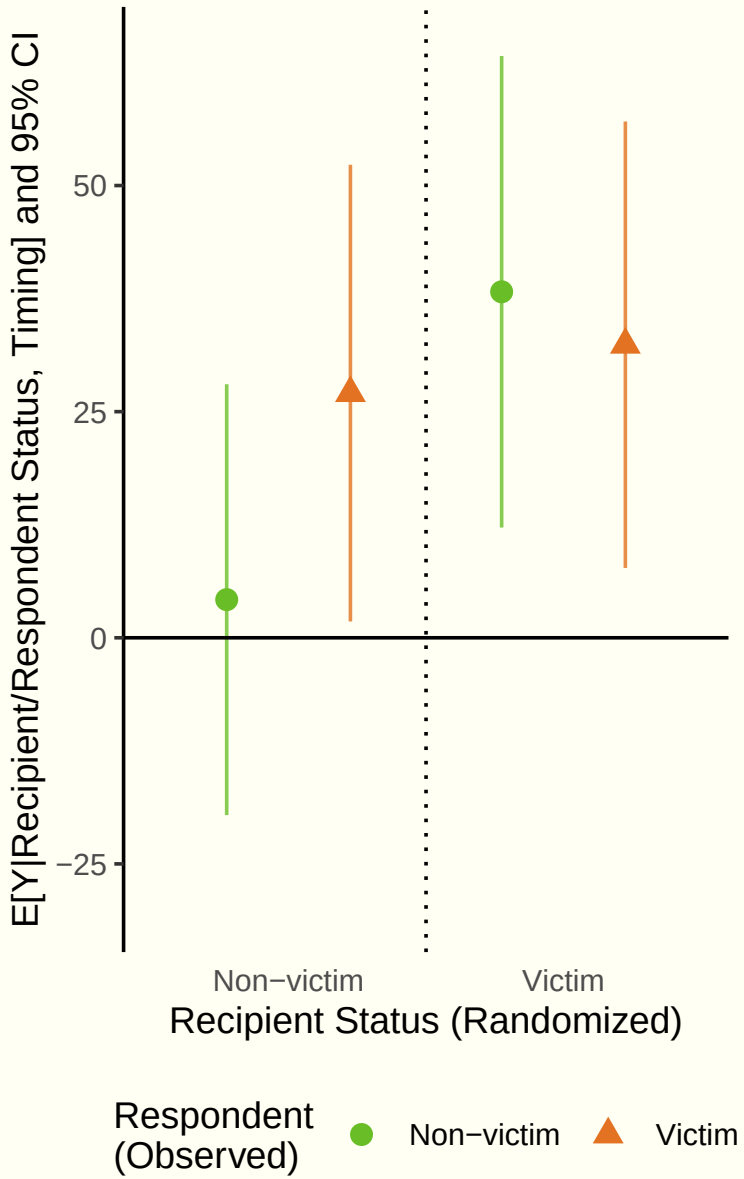
- **"Your pain"** effect: **Recipient** victim status is associated with an increase in donation of VND 18.6K (from 10.7K to 29.3K)
- **"My pain"** effect: **Respondent** victim status is associated with an increase in donation of VND 8.6K
  - consistent with existing literature
  - yet the association remains statistically indeterminate
- Decision timing is associated with a decrease in donation amount of VND 7.1K
  - and remains inconclusive

Regression Estimates

	Outcome: Donation (in 1,000 VND)					
	(1)	(2)	(3)	(4)	(5)	(6)
Main Effects						
Victim Recipient	18.65^{+}	34.04*	18.71^{+}	32.32*	50.14**	33.82*
(**"Your Pain"**)	(10.79)	(15.56)	(10.91)	(11.54)	(14.20)	(12.28)
Decision Timing	−9.71	−9.84	−17.53	−20.11^{+}	−16.87	−26.39
(1 if at the end)	(10.89)	(10.71)	(16.01)	(10.63)	(9.96)	(17.37)
Victim Household	8.62	22.83	0.81	6.22	30.54^{+}	−0.74
(**"My Pain"**)	(10.89)	(15.01)	(16.01)	(11.65)	(16.73)	(19.18)
Interaction Effects						
Victim Recipient		− 28.69			− 42.21^{+}	
× Victim Household		(21.23)			(22.24)	
Decision Timing			14.82			11.21
× Victim Household			(22.03)			(24.13)
Pre-1961 resident				✓	✓	✓
Demographic controls				✓	✓	✓
Average outcome	20	20	20	20	20	20
Observations	28	28	28	27	27	27
Adjusted R^2	0.04	0.08	0.02	0.35	0.45	0.32

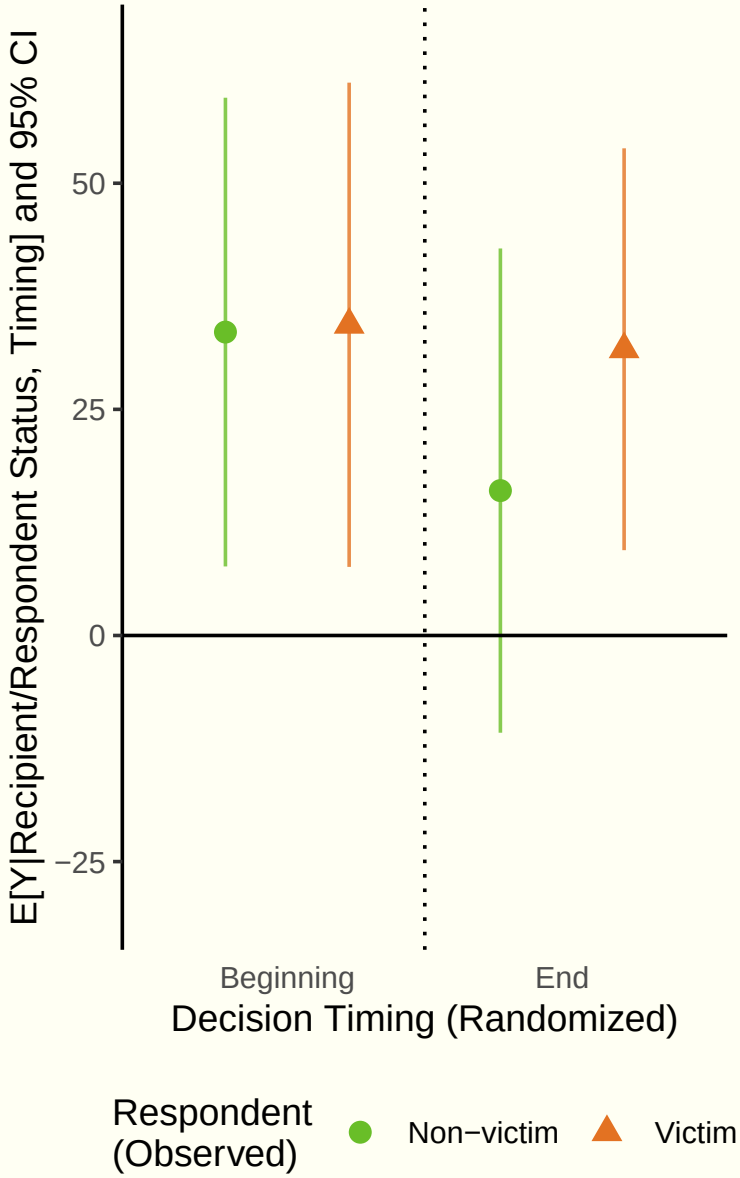
OLS estimates. Standard errors in parentheses. ** $p < 0.01$, * $p < 0.05$, $^{+}$ $p < 0.1$.

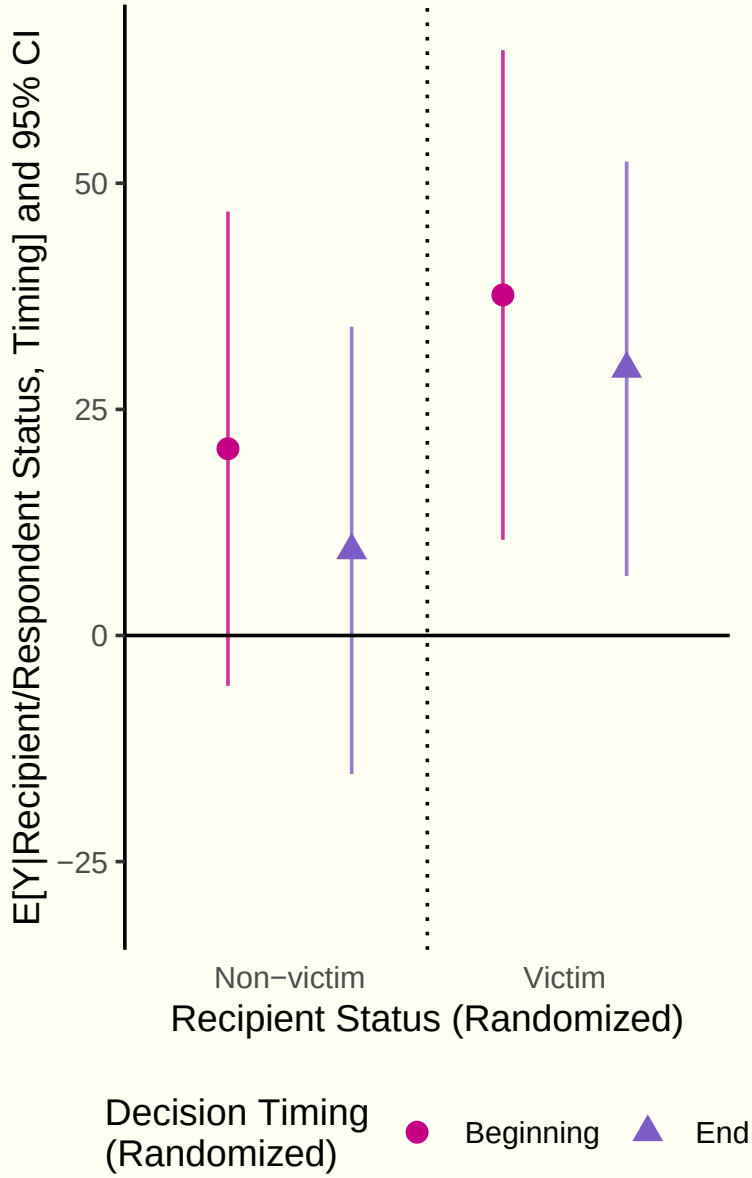
Heterogeneous Effects



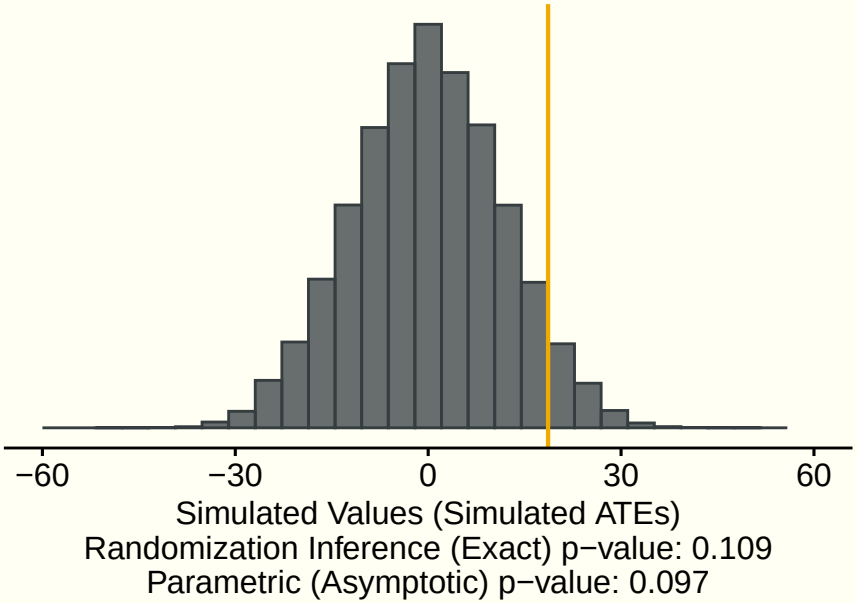
- **"Victim recipient"** (your pain) is associated with an increase in donation by **non-victim** households (dots, Model 2)
  - yet the effect is invisible among victim households (triangles)
- **"Your pain"** effect in **non**-victim's responses, but **not** in victims'
- **Heterogeneous effect** for a behavioral outcome
  - echoing previously-reported effect heterogeneity (Dinas et al., 2021; Wayne & Zhukov, 2022)
  - ANOVA: $F = 1.83, p = 0.19$ (w/o), $F = 3.60, p = 0.08$ (w/ controls)

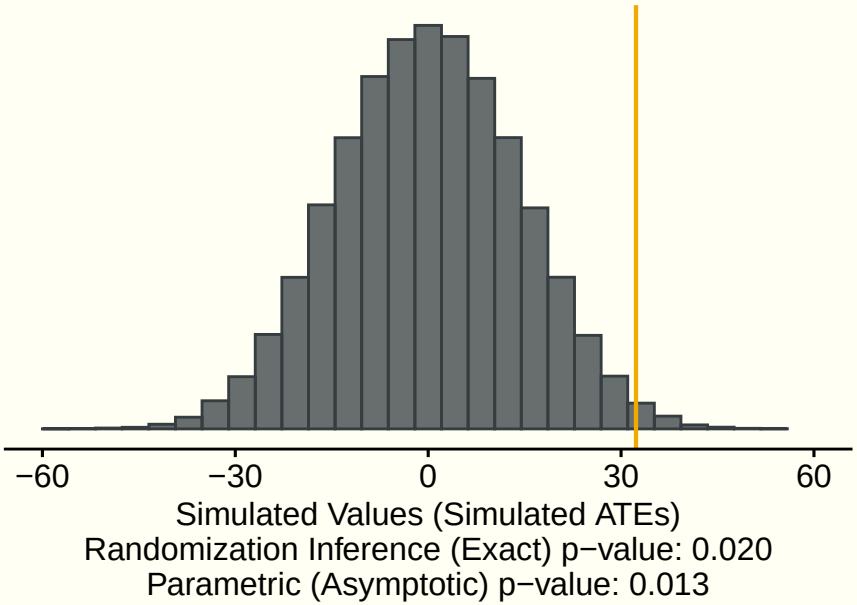
Heterogeneous Effects





Randomization Inference





- Accounting for the small sample size ($N = 28$)
  - also the right-skewed outcome distribution
  - asymptotic approach would be ill-suited
- **Randomization inference** and asymptotic inference yield similar results for **recipient** victim status
  - with a sharp null hypothesis: $\tau_i = 0 \ \forall i$
  - with (Model 4, bottom), without controls (Model 1, top) (cf. Young, 2019)

Conclusion

Your Pain, My Pain, and Altruism

- **"Your pain"** matters in generating post-war **altruism**
  - Effect **heterogeneity**: Non-victims' choices were swayed by the "your pain" treatment while victim households' choice remained stable
- **Dual** legacies of war on altruism
  1. **"My pain" effect**: War alters victim's behavior via direct exposure (e.g., Bauer et al., 2014; Bellows & Miguel, 2006, 2009; Blattman, 2009) and indirect exposure/transmission (e.g., Lindsey & Koos, 2024; Lupu & Peisakhin, 2017; Wayne & Zhukov, 2022)
  2. **"Your pain" effect**: War alters **non-victim's** behavior

  $\rightsquigarrow$ Previously under-studied legacies of political violence
- Lasting legacies of political violence beyond the first-generation victims
  - transmission via interaction? Empathy?

No Pain, No Altruism?

- **Full-scale** experiment is scheduled later this year with a bigger sample (hopefully $N = 300$–500)
- Experimental measures and **outcomes**
  - Behavioral: (1) Games (ultimatum game, trust game, and envy game) and (2) risk propensity (dichotomous choice, coin toss or not, keeping the expected value constant)
  - Attitudinal: (1) Sympathy for victims elsewhere (Hiroshima/Nagasaki/Palestine/Ukraine) and (2) anti-US sentiments (perpetrator of indiscriminate violence)
- **Mechanisms?** Mediators? Moderators?
  - causal processes (= indirect effect) and causal interactions (= conditioning effect of a mediator) (Acharya et al., 2018)
- "Long-term" effects?
  - follow-up survey in December 2024 or January 2025

Thank You

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Our Another Manuscript

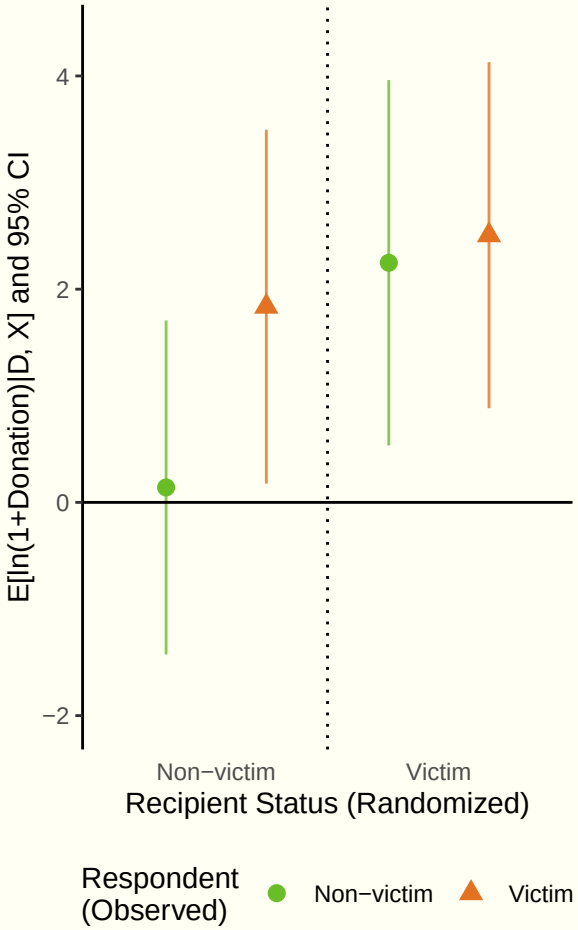
on the legacies of herbicidal warfare is available at:
https://ssrn.com/abstract=4512129

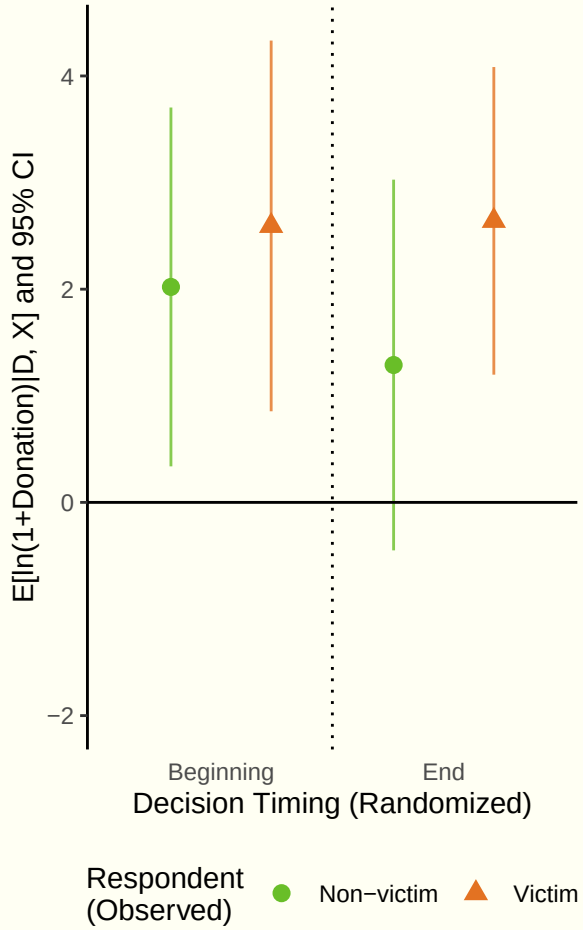
Appendix

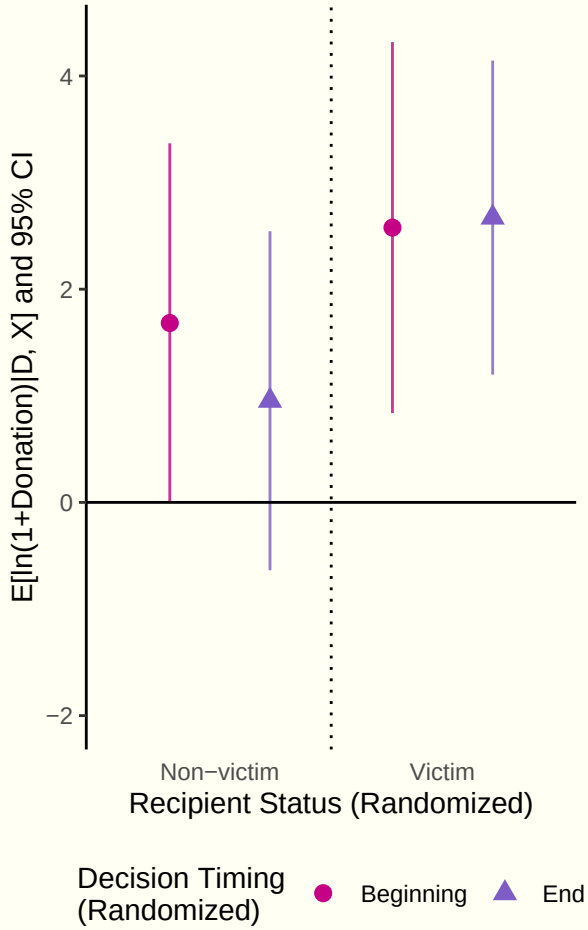
Descriptive Statistics

	N	Mean	SD	Min	Max
Outcome					
Donation (dictator game)	28	20	29.059	0	80
⇝ 20/80 = 25% approximately matches the known experimental results (∼ 20%)					
Herbicide victim status					
Household with herbicide victim(s) (1 = yes)	28	0.536	0.508	0	1
Household attributes					
Pre-herbicide (1961) resident (1 = yes)	28	0.536	0.508	0	1
Female household head (1 = yes)	28	0.464	0.508	0	1
Household size (N family members)	28	3.357	1.789	1	7
With wage income (1 = yes)	28	0.929	0.262	0	1
Annual wage income (in million VND)	28	95.793	90.575	0	300
Respondent attributes					
Age	27	57.889	13.846	32	80
Education (years)	28	9.250	4.178	0	15
Female (1 = yes)	28	0.571	0.504	0	1
Not in regression models					
Residence duration (years; NA = “for centuries”)	14	16.714	18.378	5	72
⇝ transformed into “pre-herbicide resident”					
N herbicide victims	28	0.821	0.905	0	3
N died herbicide victims	28	0.286	0.659	0	3
Family member(s) with serious illness (1 = yes)	28	0.500	0.509	0	1
N family members with serious illness	28	0.750	0.887	0	3

Heterogeneity: Logged Outcome

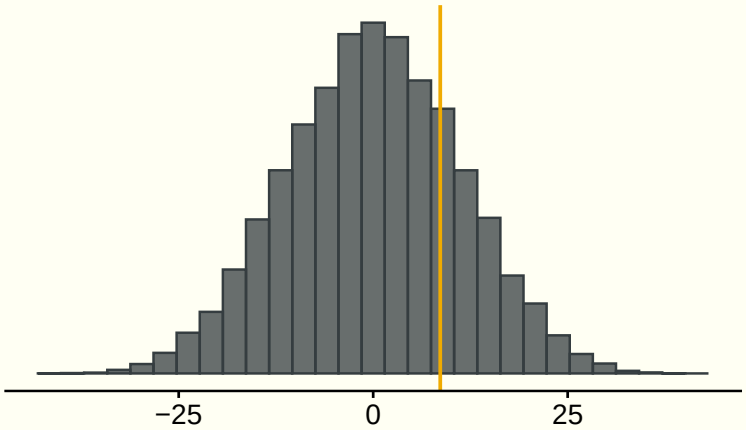






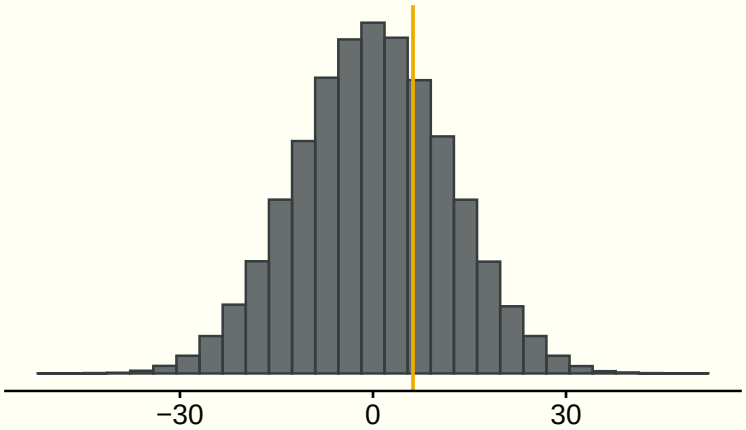
Randomization Inference

Respondent Victim, Model (1) w/o controls



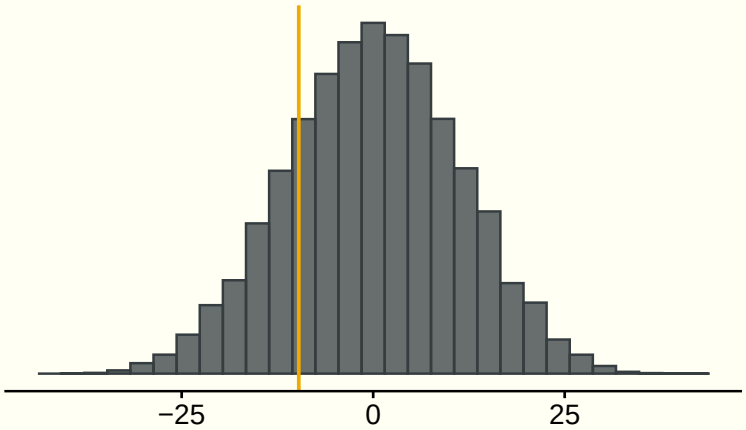
Simulated Values (Simulated ATEs)
Randomization Inference (Exact) p−value: 0.457
Parametric (Asymptotic) p−value: 0.436

Respondent Victim, Model (4) w/ controls



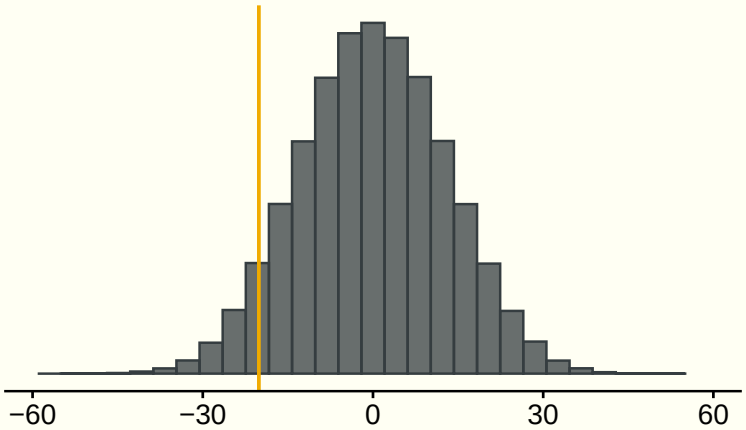
Simulated Values (Simulated ATEs)
Randomization Inference (Exact) p−value: 0.602
Parametric (Asymptotic) p−value: 0.601

Decision Timing, Model (1) w/o controls



Simulated Values (Simulated ATEs)
Randomization Inference (Exact) p−value: 0.400
Parametric (Asymptotic) p−value: 0.381

Decision Timing, Model (4) w/ controls



Simulated Values (Simulated ATEs)
Randomization Inference (Exact) p−value: 0.119
Parametric (Asymptotic) p−value: 0.078

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