

Supporting Information for *Beyond Opportunity Costs: Campaign Messages, Anger, and Turnout among the Unemployed*

Appendix A: Full CPS Regression Results

For years in which the precise number of weeks of unemployment are provided (1974 and 1990-2014), we estimate the model with *Weeks* and *Weeks*². For the years 1976-1986, we only have a 0-8 categorical variable (defined in terms of weeks in Table 2), so we estimate the model with just *Weeks*. Note that the magnitude of coefficients for *Weeks* is not comparable between these two groups—it is much larger in the years with a categorical variable because an increase of one in the variable corresponds to many additional weeks of unemployment. The full results of these probit models for each year are presented in Table A1.¹

Two of the three outlier elections (years in which the unemployment rate was relatively high but there was no significant bounce-back effect) are the Obama election years of 2008 and 2012. Our results are robust to changes in the reference point for the unemployment rate and to the functional form estimated. In Figure 4, we list the unemployment rates for November of election years, but the pattern is largely unchanged when we use the unemployment rates for different months leading up to the election or averages of the unemployment rates during the year leading up to the election. We also estimated models that substituted $\ln(\text{Weeks} + 1)$ for $(\text{Weeks} + \frac{\text{Weeks}^2}{100})$. Using the natural log form, most of our results are unchanged: the notable shifts being that 1994 and 2006 gain significance, and 2012 almost gains significance.

In an alternative specification, we estimated the probit models with a truncated version of the *Weeks* variable, so that *Weeks* for anyone who had been unemployed for a year or more was coded as “52” (this is the upper limit on the categorical variable for the years 1976-1986). Under

¹In Rosenstone’s original model, he includes a variable for the interaction of age and marital status but does not include an un-interacted dummy variable for marital status. We present the full results here following this convention, but note that the inclusion of a dummy variable for marital status does not change our results in any year.

this specification, the significance of the *Weeks* variable only changes in three cases; it attains significance in 1994 and loses significance in 2010 and 2014. As illustrated in Figure 4, 1994 and 2014 are borderline cases – at 5.6%, 1994 has the highest unemployment rate of our “low unemployment” years and at 5.8%, 2014 has the lowest unemployment rate of our “high unemployment” years. The loss of significance in 2010 is more surprising, but significance is maintained with the truncated *Weeks* variable in our alternative specification of $\ln(\text{Weeks} + 1)$.

Table 1: Probit Results: Probability of Voting, 1974-1984

Year	1974	1976	1978	1980	1982	1984
Unemployed	-0.228*** (0.0401)	-0.251*** (0.046)	-0.272*** (0.0539)	-0.192*** (0.044)	-0.220*** (0.0337)	-0.209*** (0.0378)
Weeks	0.00934** (0.00447)	0.0322*** (0.0112)	0.0270* (0.0154)	0.0116 (0.0112)	0.0363*** (0.00766)	0.0332*** (0.00909)
Weeks ²	-0.00814 (0.00592)					
Income	0.0583*** (0.00261)	0.0494*** (0.00373)	0.0392*** (0.00392)	0.0314*** (0.00371)	0.0445*** (0.00234)	0.0532*** (0.00244)
Education ²	0.00391*** (0.0000898)	0.00561*** (0.000129)	0.00459*** (0.000133)	0.00579*** (0.00014)	0.00453*** (0.0000957)	0.00570*** (0.00011)
Age	0.0450*** (0.00266)	0.0285*** (0.00339)	0.0428*** (0.00343)	0.0313*** (0.00338)	0.0463*** (0.00266)	0.0262*** (0.00292)
Age ²	-0.0161*** (0.00319)	0.00145 (0.00406)	-0.0103** (0.00402)	-0.00158 (0.00399)	-0.0156*** (0.00317)	0.00501 (0.00354)
Age x Unmarried	-0.318*** (0.0388)	-0.303*** (0.047)	-0.337*** (0.0456)	-0.335*** (0.0457)	-0.416*** (0.0354)	-0.384*** (0.038)
Sex	0.0593*** (0.0125)	0.0888*** (0.0161)	0.0407** (0.0169)	0.111*** (0.0168)	0.0738*** (0.0121)	0.171*** (0.0129)
South	-0.285*** (0.0132)	-0.0844*** (0.0168)	-0.253*** (0.0182)	-0.177*** (0.018)	-0.310*** (0.0133)	-0.155*** (0.0141)
Black	0.0922*** (0.0217)	0.116*** (0.0243)	0.151*** (0.0257)	0.118*** (0.0244)	0.273*** (0.0204)	0.316*** (0.0217)
Student						
Constant	-2.606*** (0.0554)	-2.196*** (0.0719)	-2.626*** (0.0739)	-2.165*** (0.0725)	-2.457*** (0.0548)	-2.076*** (0.0593)
Observations	48773	28469	26431	25990	49888	44846

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Table 1 Continued: Probit Results: Probability of Voting, 1986-1998

Year	1986	1990	1992	1994	1996	1998
Unemployed	-0.196*** (0.0417)	-0.225*** (0.0379)	-0.144*** (0.0369)	-0.281** (0.112)	-0.209* (0.115)	-0.131 (0.12)
Weeks	0.0304*** (0.0103)	0.0104*** (0.00364)	0.00552* (0.00292)	0.0296 (0.0229)	-0.0359 (0.0252)	0.0353 (0.0223)
Weeks ²		-0.0113*** (0.0042)	-0.00481 (0.0033)	-0.0365 (0.055)	0.0764 (0.0587)	-0.0473 (0.044)
Income	0.0326*** (0.00254)	0.0333*** (0.00172)	0.0476*** (0.00193)	0.0436*** (0.00194)	0.0453*** (0.00211)	0.0373*** (0.00217)
Education ²	0.00437*** (0.000108)	0.00455*** (0.0000894)	0.00213*** (0.0000364)	0.00629*** (0.000132)	0.00194*** (0.0000377)	0.00150*** (0.0000357)
Age	0.0431*** (0.00291)	0.0538*** (0.00271)	0.0303*** (0.00291)	0.0507*** (0.00288)	0.0351*** (0.00322)	0.0500*** (0.00317)
Age ²	-0.0115*** (0.00342)	-0.0256*** (0.00314)	-0.00279 (0.00343)	-0.0217*** (0.00327)	-0.00575 (0.00375)	-0.0186*** (0.00359)
Age x Unmarried	-0.459*** (0.0367)	-0.479*** (0.0312)	-0.432*** (0.0341)	-0.484*** (0.0324)	-0.501*** (0.0357)	-0.509*** (0.034)
Sex	0.0729*** (0.0132)	0.114*** (0.0109)	0.149*** (0.0118)	0.0868*** (0.0115)	0.136*** (0.0127)	0.0749*** (0.0124)
South	-0.167*** (0.0144)	-0.156*** (0.012)	-0.137*** (0.0129)	-0.191*** (0.0126)	-0.102*** (0.0139)	-0.216*** (0.0137)
Black	0.247*** (0.0209)	0.200*** (0.0197)	0.189*** (0.0211)	0.122*** (0.0212)	0.289*** (0.0235)	0.321*** (0.0228)
Student		0.171*** (0.0312)	0.471*** (0.0308)	0.276*** (0.0332)	0.437*** (0.0341)	0.299*** (0.0361)
Constant	-2.507*** (0.0611)	-2.673*** (0.0569)	-4.325*** (0.0766)	-2.620*** (0.0615)	-4.515*** (0.0841)	-4.497*** (0.0833)
Observations	41134	60473	59411	54012	47424	46884

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Table 1 Continued: Probit Results: Probability of Voting, 2000-2010

Year	2000	2002	2004	2006	2008	2010
Unemployed	-0.212*** (0.0464)	-0.254*** (0.04)	-0.150*** (0.0388)	-0.211*** (0.0463)	-0.112*** (0.0366)	-0.0813** (0.0354)
Weeks	0.00211 (0.00434)	0.0113*** (0.00295)	0.00342 (0.00292)	0.00331 (0.00371)	0.00253 (0.00271)	0.00309* (0.00187)
Weeks ²	-0.00154 (0.00475)	-0.0111*** (0.00321)	-0.00215 (0.00298)	0.00118 (0.00379)	-0.00249 (0.00288)	-0.00231 (0.00174)
Income	0.0493*** (0.00196)	0.0391*** (0.00188)	0.0419*** (0.00173)	0.0371*** (0.00182)	0.0446*** (0.00181)	0.0343*** (0.00159)
Education ²	0.00692*** (0.000129)	0.00608*** (0.000116)	0.00738*** (0.000124)	0.00626*** (0.000119)	0.00709*** (0.000126)	0.00556*** (0.000108)
Age	0.0410*** (0.00287)	0.0400*** (0.0028)	0.0345*** (0.00271)	0.0397*** (0.00279)	0.0274*** (0.00269)	0.0417*** (0.00244)
Age ²	-0.0202*** (0.00327)	-0.0134*** (0.00315)	-0.0162*** (0.00308)	-0.0122*** (0.0031)	-0.00952*** (0.00301)	-0.0195*** (0.00263)
Age x Unmarried	0.369*** (0.0323)	0.416*** (0.0288)	0.329*** (0.0302)	0.348*** (0.029)	0.128*** (0.0302)	0.314*** (0.0253)
Sex	0.164*** (0.0118)	0.0963*** (0.0108)	0.179*** (0.0112)	0.116*** (0.0112)	0.176*** (0.0115)	0.0626*** (0.0103)
South	-0.0297** (0.013)	-0.0511*** (0.0123)	-0.0783*** (0.0125)	-0.152*** (0.0124)	-0.0528*** (0.0128)	-0.131*** (0.0114)
Black	0.245*** (0.0204)	0.189*** (0.0195)	0.215*** (0.0204)	0.198*** (0.0208)	0.371*** (0.0215)	0.212*** (0.0178)
Student	0.209*** (0.0289)	0.162*** (0.0301)	0.255*** (0.0272)	0.245*** (0.0305)	0.187*** (0.0287)	0.251*** (0.0294)
Constant	-2.562*** (0.0603)	-2.791*** (0.06)	-2.197*** (0.0568)	-2.757*** (0.0606)	-2.044*** (0.0581)	-2.726*** (0.0552)
Observations	53270	63081	60502	58860	56566	68268

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Table 1 Continued: Probit Results:
Probability of Voting, 2012-2014

Year	2012	2014
Unemployed	-0.125*** (0.0416)	-0.182*** (0.0459)
Weeks	5.34e-05 (0.00228)	0.00816*** (0.00275)
Weeks ²	0.000584 (0.00194)	-0.00620*** (0.00238)
Income	0.0385*** (0.00188)	0.0388*** (0.00188)
Education ²	0.00774*** (0.000145)	0.00589*** (0.000128)
Age	0.0188*** (0.00299)	0.0194*** (0.00278)
Age ²	0.00322 (0.00334)	0.00841*** (0.00303)
Age x Unmarried	0.433*** (0.0314)	0.367*** (0.0287)
Sex	0.149*** (0.0125)	0.0767*** (0.0117)
South	-0.0662*** (0.0137)	-0.00315 (0.0126)
Black	0.607*** (0.0235)	0.297*** (0.0204)
Student	0.476*** (0.0324)	0.212*** (0.0259)
Constant	-1.820*** (0.0644)	-2.372*** (0.0622)
Observations	54490	52421

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Table 2: Coding of unemployment variable for years 1976-1986 by number of weeks

Categorical Value	Number of Weeks
0	0
1	1-4
2	5-6
3	7-10
4	11-14
5	15-26
6	27-39
7	40-51
8	52+

Appendix B: CPS Check for Unobserved Factors

Unem. Rate is the unemployment rate during the month of an individual's job loss. We control for this rate in every regression with a significant coefficient on *Weeks* to confirm that it is the duration of unemployment that affects turnout, rather than some prior characteristics specific to people who lose their jobs at times of higher unemployment, manifesting through *Weeks* as a proxy for varying economic contexts at the time of job loss.

For those years in which we only had a categorical variable for duration of unemployment, we used the midpoint of the range to estimate the month of job loss.

Table B1: Check for Unobserved Factors: 1974-1986

Year	1974	1976	1978	1982	1984	1986
Unemployed	0.0579 (0.188)	0.759 (0.976)	-1.863 (1.224)	-1.394 (1.332)	-0.611 (0.535)	-3.021 (2.249)
Unem. Rate	-0.0451 (0.0289)	-0.132 (0.128)	0.277 (0.213)	0.104 (0.118)	0.0583 (0.0774)	0.410 (0.327)
Weeks	0.00710 (0.00469)	0.0383*** (0.0126)	0.00337 (0.0239)	0.0763* (0.0460)	0.0224 (0.0169)	0.0159 (0.0155)
Weeks ²	-0.00598 (0.00607)					
Income	0.0582*** (0.00261)	0.0494*** (0.00374)	0.0392*** (0.00392)	0.0445*** (0.00234)	0.0532*** (0.00244)	0.0326*** (0.00254)
Education ²	0.00391*** (8.98e-05)	0.00562*** (0.000129)	0.00459*** (0.000133)	0.00453*** (9.57e-05)	0.00570*** (0.000110)	0.00437*** (0.000108)
Age	0.0449*** (0.00266)	0.0285*** (0.00339)	0.0427*** (0.00343)	0.0463*** (0.00266)	0.0261*** (0.00292)	0.0431*** (0.00291)
Age ²	-0.0161*** (0.00319)	0.00145 (0.00406)	-0.0102** (0.00402)	-0.0157*** (0.00317)	0.00502 (0.00354)	-0.0115*** (0.00342)
Age x Unmarried	-0.318*** (0.0388)	-0.304*** (0.0470)	-0.338*** (0.0456)	-0.416*** (0.0354)	-0.384*** (0.0380)	-0.459*** (0.0367)
Sex	0.0593*** (0.0125)	0.0889*** (0.0161)	0.0407** (0.0169)	0.0737*** (0.0121)	0.171*** (0.0129)	0.0729*** (0.0132)
South	-0.285*** (0.0132)	-0.0847*** (0.0168)	-0.253*** (0.0182)	-0.310*** (0.0133)	-0.155*** (0.0141)	-0.167*** (0.0144)
Black	0.0922*** (0.0217)	0.116*** (0.0243)	0.151*** (0.0257)	0.273*** (0.0204)	0.316*** (0.0217)	0.247*** (0.0209)
Student						
Constant	-2.605*** (0.0554)	-2.196*** (0.0719)	-2.626*** (0.0739)	-2.457*** (0.0548)	-2.076*** (0.0593)	-2.507*** (0.0611)
Observations	48773	28469	26431	49888	44846	41134

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Table B1 Continued: Check for Unobserved Factors: 1990-2014

Year	1990	1992	2002	2010	2014
Unemployed	-0.310 (0.626)	-0.278 (0.558)	-0.477 (0.518)	0.0313 (0.328)	-0.0904 (0.416)
Unem. Rate	0.0140 (0.102)	0.0181 (0.0753)	0.0386 (0.0892)	-0.0121 (0.0355)	-0.0162 (0.0735)
Weeks	0.0109** (0.00513)	0.00536* (0.00299)	0.0112*** (0.00295)	0.00366 (0.00249)	0.00867** (0.00360)
Weeks ²	-0.0117** (0.00510)	-0.00441 (0.00371)	-0.0104*** (0.00359)	-0.00315 (0.00302)	-0.00634*** (0.00246)
Income	0.0333*** (0.00172)	0.0476*** (0.00193)	0.0392*** (0.00188)	0.0343*** (0.00159)	0.0388*** (0.00188)
Education ²	0.00455*** (8.94e-05)	0.00213*** (3.64e-05)	0.00608*** (0.000116)	0.00556*** (0.000108)	0.00589*** (0.000128)
Age	0.0538*** (0.00271)	0.0303*** (0.00291)	0.0400*** (0.00280)	0.0417*** (0.00244)	0.0195*** (0.00278)
Age ²	-0.0256*** (0.00314)	-0.00278 (0.00343)	-0.0134*** (0.00315)	-0.0195*** (0.00263)	0.00841*** (0.00303)
Age*Unmarried	-0.479*** (0.0312)	-0.432*** (0.0341)	0.416*** (0.0288)	0.314*** (0.0253)	0.367*** (0.0287)
Sex	0.114*** (0.0109)	0.149*** (0.0118)	0.0963*** (0.0108)	0.0626*** (0.0103)	0.0767*** (0.0117)
South	-0.156*** (0.0120)	-0.137*** (0.0129)	-0.0511*** (0.0123)	-0.131*** (0.0114)	-0.00314 (0.0126)
Black	0.200*** (0.0197)	0.189*** (0.0211)	0.188*** (0.0195)	0.212*** (0.0178)	0.297*** (0.0204)
Student	0.171*** (0.0312)	0.471*** (0.0308)	0.162*** (0.0301)	0.251*** (0.0294)	0.212*** (0.0259)
Constant	-2.673*** (0.0569)	-4.325*** (0.0766)	-2.792*** (0.0600)	-2.726*** (0.0552)	-2.372*** (0.0622)
Observations	60473	59411	63081	68268	52421

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

Appendix C: Demographic Characteristics of Unemployed People

Table C1: Observable Characteristics of the Unemployed by Economic Context

	High Unemployment Years	Low Unemployment Years
Age	33.1	34.0
Female	45.8%	48.3%
Race:		
White	76.8%	73.8%
Black	17.9%	15.0%
Other	5.4%	6.7%
Education	1.66	1.51
Income	1.61	1.57

Table C2: Observable Characteristics of the Employed by Economic Context

	High Unemployment Years	Low Unemployment Years
Age	39.4	40.2
Female	45.5%	47.6%
Race:		
White	87.0%	85.5%
Black	8.5%	7.2%
Other	4.5%	7.3%

We are limited to the three racial categories used in Tables C1 and C2 because they are the only categories consistently used across all years of our data. Demographics for employed people are listed as well, to illustrate any overall changes in the composition of the survey population. Education and Income are based on terciles by year (coded 1-3) and are therefore already adjusted to general population changes.

Appendix D: Pooled Regression Results

The results presented below come from a probit regression, pooling the observations from all elections. We interact the Weeks Unemployed variable with the annual Unemployment Rate, including year fixed effects. Standard errors are clustered by survey year. When interpreting the results, readers should note that an unemployment rate of 5.5% would be coded as 5.5 for our Unemployment Rate variable, not as 0.055.

We converted the *Weeks* variable for 1974 and 1990-2014 to the categorical form of the 1976-1986 variable for consistency. Education and income were converted to terciles by year for comparability across time.

Table D1: Pooled Probit Results (1974-2014)

DV: Turnout	Coefficient	SE
Unemployed	-0.217***	(0.0122)
Weeks	-0.00950	(0.00604)
Weeks X Unemployment Rate	0.00410***	(0.000749)
Income Tercile	0.210***	(0.00759)
Education Tercile	0.333***	(0.0112)
Age	0.0457***	(0.00254)
Age ²	-0.0197***	(0.00255)
Age X Unmarried	-0.0416	(0.0847)
Sex	0.100***	(0.0101)
South	-0.137***	(0.0203)
Black	0.197***	(0.0235)
Student	0.180***	(0.0304)
1976.year	0.164***	(0.00722)
1978.year	-0.229***	(0.00797)
1980.year	0.291***	(0.00781)
1982.year	0.136***	(0.00359)
1984.year	0.456***	(0.00464)
1986.year	-0.0383***	(0.00500)
1990.year	0.0238***	(0.00351)
1992.year	0.595***	(0.00467)
1994.year	-0.0142***	(0.00424)
1996.year	0.289***	(0.00481)
1998.year	-0.134***	(0.00416)
2000.year	0.0972***	(0.0133)
2002.year	-0.244***	(0.0141)
2004.year	0.273***	(0.0131)
2006.year	-0.211***	(0.0142)
2008.year	0.250***	(0.0130)
2010.year	-0.379***	(0.0145)
2012.year	0.446***	(0.0124)
2014.year	-0.186***	(0.0148)
Constant	-2.478***	(0.0433)
Observations	1,006,850	

Robust standard errors in parentheses (clustered by year)

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (two-tailed)

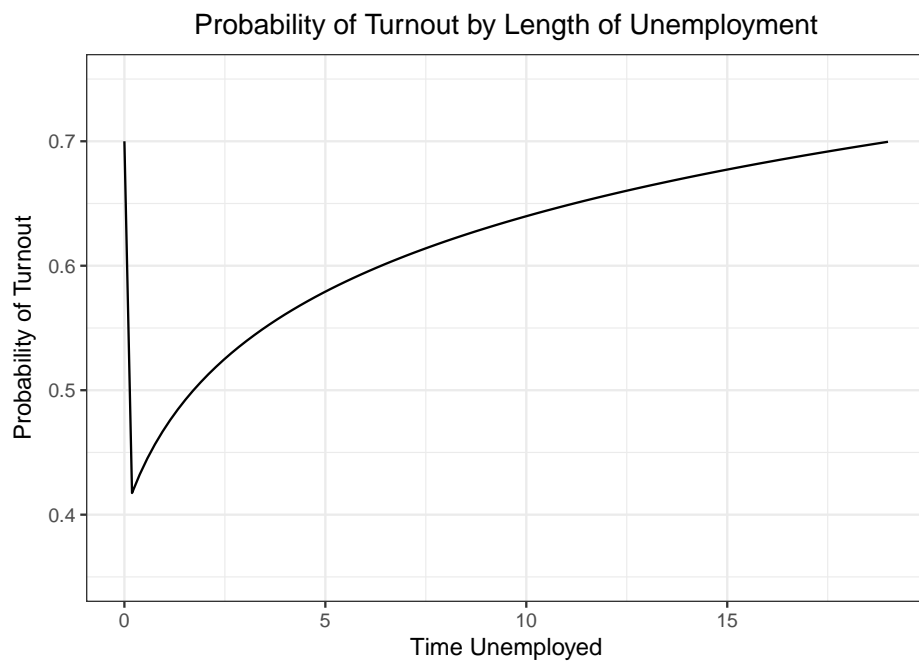
Appendix E: Formal Model of Bounce-back Effect

The logic of the unemployment and bounce-back effects can be illustrated with a simple formalization. At time $t = 0$, assume that citizen i is employed and she votes with a probability $v_0 = x$. At time $t = 1$, she will either keep her job ($E_1 = 1$) or lose it ($E_1 = 0$). If she keeps her job, she continues to vote with probability $v_1 = x$. If she loses her job, she experiences withdrawal emotions and votes with a reduced probability of $v_1 = x - d$ where $d > 0$. We assume, for simplification of notation, that the individual loses her job at most once between time $t = 0$ and the election.

An election occurs at time t and citizen i votes with probability $v_t = x + d(E_t - 1) + \ln(p)a$, where a is the anger-inducing effect of politicization of unemployment. Unemployed people are much more sensitive to this effect than the employed,² and the effect is multiplied by $\ln(p)$, where $p = t + 1 - \max(\tau, \text{s.t. } E_\tau = 1)$. In other words, p corresponds to the number of periods citizen i has been unemployed plus one, so that the logged term equals zero for employed citizens. So if $E_t = 1$, citizen i votes with probability $v_t = x$. If $E_t = 0$, citizen i votes with probability $v_t = x - d + \ln(p)a$. Thus, for each additional period in which citizen i is unemployed and exposed to politicization, her expected level of anger increases and v_t increases along with it. The increase in anger over time can be attributed either to multiple doses (citizen i is exposed to the politicization multiple times and thus her level of anger increases) or increase probability of exposure (her likelihood of being exposed to the politicization is greater if she has been unemployed for a longer period of time, so the level of anger is greater in expectation). If unemployment is low, it is not politicized, and $a = 0$.

The figure below illustrates the proposed relationship between duration of unemployment and probability of voting.

²Employed people may perceive the unemployment rate as symptomatic of their own possibilities of losing their jobs, but it is reasonable to suppose that campaign discussions of unemployment are especially poignant for people who have lost their jobs.



Note: Hypothetical turnout probabilities as a function of the length of unemployment prior to an election, where $x = 0.7$, $d = 0.3$, $a = 0.1$

Appendix F: MTurk Pilot Survey Experiment Results

These results come from a survey experiment conducted through Amazon’s Mechanical Turk platform. Table F1 includes only those respondents who were employed at the time of the survey.

Table F1: Vignette Effects Among the Employed

	<i>Dependent variable:</i>			
	Anger (1)	Guilt (2)	Vote 2016 (3)	(4)
Human Cost	0.121 (0.107)	−0.003 (0.018)	0.051 (0.072)	0.391** (0.129)
Blame	−0.031 (0.107)	−0.022 (0.018)	0.013 (0.072)	0.107 (0.125)
Vote 2012				1.378*** (0.107)
Human Cost X Vote 2012				−0.360** (0.146)
Blame X Vote 2012				−0.160 (0.143)
Constant	2.656*** (0.075)	2.026*** (0.013)	3.537*** (0.051)	2.431*** (0.096)
Observations	810	810	778	773
R ²	0.002	0.003	0.001	0.309
Adjusted R ²	−0.001	0.0004	−0.001	0.305

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (one-tailed). Source: Authors’ survey.