Online Appendices

When Will People Pay to Pollute?
Environmental Taxes, Political Trust, and Experimental Evidence from Britain

British Journal of Political Science

Malcolm Fairbrother
University of Bristol
ggmhf@bristol.ac.uk

Contents

Appendix A: Full question wordings

A. How willing would you be to pay higher taxes in order to protect the environment?
B. How willing would you be to pay higher taxes in order to protect the environment, if the government reduced other taxes you pay by the same amount?
C. How willing would you be to pay higher taxes on things you buy that pollute the environment?
D. How willing would you be to pay higher taxes on things you buy that pollute the environment, if the government reduced other taxes you pay by the same amount?
E. How willing would you be to pay higher taxes on things you buy that pollute the environment, like petrol or electricity?
F. How willing would you be to pay higher taxes on things you buy that pollute the environment, like petrol or electricity, if the government reduced other taxes you pay by the same amount?
G. How willing would you be to pay higher taxes, if the government spent the extra money on protecting the environment?
H. How willing would you be to pay higher taxes, if the government spent the extra money on protecting the environment and reduced other taxes you pay by the same amount?
I. How willing would you be to pay higher taxes, if the government promised it would spend the extra money on protecting the environment?
J. How willing would you be to pay higher taxes, if the government promised it would spend the extra money on protecting the environment and reduce other taxes you pay by the same amount?

Appendix B

Table B1: Descriptive Statistics

Variable	Mean	Min	Max	Unique	Valid	SD
Age (years-16)	34.21	0	80	80	2413	18.17
Education						
Degree (reference)	0.25	0	1	2	2400	
Other higher degree	0.14	0	1	2	2400	
A-level etc.	0.22	0	1	2	2400	
GCSE etc.	0.24	0	1	2	2400	
Other qualification	0.07	0	1	2	2400	
No qualification	0.08	0	1	2	2400	
Party Identification						
Conservative	0.40	0	1	2	1099	
Labour	0.42	0	1	2	1099	
Other	0.18	0	1	2	1099	
Income	2.20	0	16.67	1356	2326	1.31
Male	0.46	0	1	2	2413	0.50
Rural	0.23	0	1	2	2413	0.42
Political Distrust	0.71	0	1	5	1788	0.32
LDSMRT	0.24	0	1	2	1988	0.43
DCRKD	1.30	0	2	3	1953	0.73
Belief in Climate Change	0.80	0	1	5	2141	0.26
G_OPECL30	0.85	0	1	2	2231	0.36
GW	1.48	0	2	3	2231	0.61
Left Ideology	0.63	0	1	3	2166	0.38
ADQHOUS	0.66	0	1	2	2190	0.47
JOBS	0.60	0	1	2	2220	0.49
Interest in Politics	1.34	0	3	4	2325	0.93

Appendix C

Table C1: Model with Treatment Dummies	
Fixed Effects	
Treatment B	1.15**
	(0.00)
Treatment C	0.16
	(0.11)
Treatment D	1.13**
	(0.00)
Treatment E	-0.11
	(0.19)
Treatment F	0.76**
	(0.00)
Treatment G	0.05
	(0.37)
Treatment H	0.84**
	(0.00)
Treatment I	0.12
	(0.17)
Treatment J	0.45**
	(0.00)
(Intercept)	0.61**
	(0.00)
SD of the Random Intercepts	
Households	0.64
Cutpoints	
1	0.97
2	2.43
N (households, individuals)	1385, 2236

Note: Figures in parentheses are the modelled probabilities of the parameter having the opposite sign; coefficients are marked with * if the probability is less than 0.05, ** if less than 0.01.

Appendix D

Table D1: Model contrasting Scenarios H and J	
Fixed Effects	
Treatment J	-0.37**
	(0.01)
(Intercept)	1.35**
	(0.00)
SD of the Random Intercepts	
Households	0.75
Cutpoints	
1	0.85
2	2.30
N (households, individuals)	275, 441

Note: Figures in parentheses are the modelled probabilities of the parameter having the opposite sign; coefficients are marked with * if the probability is less than 0.05, ** if less than 0.01.

Table D2: Raw Counts of Responses in Scenarios H and J

Treatment Group	**Not at all willing**	**Not very willing**	**Fairly willing**	**Very willing**	**Total Valid N**
H	30	46	97	49	222
J	50	53	84	32	219

Appendix E

Table E1: Means and Standard Deviations of Covariates by Treatment Group

	A	B	C	D	E	F	G	H	I	J
Age (years-16)	34.77	36.98	31.01	33.59	33.95	33.73	34.91	33.06	35.52	34.99
	(17.36)	(19.11)	(19.26)	(17.79)	(17.45)	(18.02)	(18.51)	(16.32)	(19.14)	(18.32)
Education										
Degree (reference)	0.24	0.24	0.28	0.29	0.26	0.24	0.23	0.24	0.22	0.20
	(0.43)	(0.43)	(0.45)	(0.46)	(0.44)	(0.43)	(0.42)	(0.43)	(0.41)	(0.40)
Other higher degree	0.11	0.12	0.12	0.11	0.12	0.16	0.19	0.13	0.14	0.16
	(0.32)	(0.33)	(0.33)	(0.32)	(0.33)	(0.37)	(0.39)	(0.34)	(0.35)	(0.37)
A-level etc.	0.22	0.22	0.22	0.21	0.19	0.25	0.19	0.21	0.22	0.25
	(0.42)	(0.41)	(0.41)	(0.41)	(0.39)	(0.43)	(0.39)	(0.41)	(0.42)	(0.44)
GCSE etc.	0.25	0.23	0.27	0.21	0.26	0.23	0.25	0.27	0.24	0.23
	(0.44)	(0.42)	(0.45)	(0.41)	(0.44)	(0.42)	(0.44)	(0.44)	(0.43)	(0.42)
Other qualification	0.10	0.08	0.04	0.08	0.07	0.06	0.06	0.07	0.08	0.07
	(0.30)	(0.27)	(0.20)	(0.27)	(0.25)	(0.24)	(0.23)	(0.25)	(0.27)	(0.26)
No qualification	0.07	0.11	0.06	0.09	0.10	0.07	0.08	0.08	0.10	0.10
	(0.26)	(0.31)	(0.24)	(0.28)	(0.30)	(0.25)	(0.27)	(0.27)	(0.30)	(0.29)
Party Identification										
Conservative	0.35	0.42	0.45	0.35	0.42	0.34	0.40	0.34	0.55	0.34
	(0.48)	(0.50)	(0.50)	(0.48)	(0.50)	(0.48)	(0.49)	(0.48)	(0.50)	(0.47)
Labour	0.50	0.37	0.38	0.43	0.37	0.44	0.47	0.42	0.28	0.55
	(0.50)	(0.48)	(0.49)	(0.50)	(0.49)	(0.50)	(0.50)	(0.50)	(0.45)	(0.50)
Other	0.15	0.21	0.18	0.22	0.20	0.21	0.14	0.24	0.17	0.12
	(0.36)	(0.41)	(0.38)	(0.42)	(0.40)	(0.41)	(0.34)	(0.43)	(0.38)	(0.32)
Income	2.05	2.21	2.13	2.31	2.16	2.27	2.25	2.43	2.29	1.93
	(1.02)	(1.10)	(1.24)	(1.32)	(1.25)	(1.42)	(1.38)	(1.50)	(1.68)	(1.09)
Male	0.42	0.45	0.47	0.43	0.45	0.44	0.48	0.49	0.48	0.46
	(0.49)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)	(0.50)
Rural	0.26	0.29	0.22	0.18	0.20	0.19	0.20	0.31	0.22	0.22
	(0.44)	(0.45)	(0.41)	(0.39)	(0.40)	(0.40)	(0.40)	(0.46)	(0.41)	(0.41)
Political Distrust	0.73	0.73	0.67	0.68	0.73	0.72	0.70	0.71	0.71	0.71
	(0.32)	(0.32)	(0.35)	(0.34)	(0.28)	(0.32)	(0.32)	(0.30)	(0.32)	(0.32)
LDSMRT	0.24	0.23	0.29	0.27	0.22	0.22	0.22	0.24	0.26	0.25
	(0.43)	(0.42)	(0.46)	(0.45)	(0.42)	(0.41)	(0.42)	(0.43)	(0.44)	(0.43)
DCRKD	1.34	1.34	1.22	1.24	1.34	1.32	1.20	1.33	1.31	1.32
	(0.73)	(0.72)	(0.76)	(0.78)	(0.70)	(0.72)	(0.74)	(0.73)	(0.72)	(0.75)
Belief in Climate Change	0.76	0.84	0.79	0.81	0.77	0.82	0.80	0.81	0.76	0.79
	(0.29)	(0.22)	(0.26)	(0.26)	(0.27)	(0.25)	(0.25)	(0.26)	(0.27)	(0.26)
G_OPECL30	0.81	0.89	0.83	0.86	0.83	0.89	0.85	0.86	0.81	0.86
	(0.40)	(0.31)	(0.38)	(0.35)	(0.38)	(0.32)	(0.36)	(0.35)	(0.40)	(0.35)
GW	1.45	1.54	1.47	1.53	1.42	1.51	1.49	1.53	1.40	1.44
	(0.63)	(0.62)	(0.60)	(0.62)	(0.62)	(0.59)	(0.63)	(0.60)	(0.62)	(0.60)
Left Ideology	0.64	0.59	0.58	0.66	0.62	0.64	0.64	0.60	0.65	0.66
	(0.38)	(0.39)	(0.40)	(0.38)	(0.38)	(0.38)	(0.37)	(0.37)	(0.37)	(0.38)
ADQHOUS	0.65	0.61	0.60	0.71	0.64	0.68	0.68	0.63	0.70	0.68
	(0.48)	(0.49)	(0.49)	(0.46)	(0.48)	(0.47)	(0.47)	(0.49)	(0.46)	(0.47)
JOBS	0.64	0.58	0.57	0.61	0.59	0.61	0.59	0.58	0.59	0.65
	(0.48)	(0.50)	(0.50)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.49)	(0.48)
Interest in Politics	1.19	1.32	1.42	1.38	1.19	1.41	1.47	1.37	1.36	1.32
	(0.97)	(0.92)	(0.89)	(0.87)	(0.93)	(0.96)	(0.92)	(0.90)	(0.95)	(0.92)

Appendix F

```
# R code for replicating analyses in "When Will People Pay to
Pollute? Environmental Taxes, Political Trust, and
Experimental Evidence from Britain"

# data can be obtained:
# University of Essex. Institute for Social and Economic
Research, NatCen Social Research. (2015). Understanding
Society: Innovation Panel, Waves 1-7, 2008-2014. [data
collection]. 5th Edition. UK Data Service. SN: 6849,
http://dx.doi.org/10.5255/UKDA-SN-6849-6.

library(readstata13)
library(vcdExtra)
library(MCMCglmm)
library(ggplot2)
library(ggrepel)

indresp <- data.frame(read.dta13("g_indresp_ip.dta")) # Data
from the 2413 individual interviews
indresp <- subset(indresp, select=c(g_hidp, g_hiqual_dv,
grep("fimnlabgrs", names(indresp)), grep("fimngrs",
names(indresp)), grep("env", names(indresp)), grep("opecl",
names(indresp)), grep("ldsmrt", names(indresp)), grep("dcrkd",
names(indresp)), grep("high", names(indresp)), grep("vote",
names(indresp)), grep("worktrav", names(indresp)),
grep("caruse", names(indresp)), grep("avtemp",
names(indresp)), grep("jobs", names(indresp)), grep("qhous",
names(indresp)), g_racel_dv, grep("istrtdat", names(indresp)),
g_indmode, g_hhorig, g_sex, g_dvage))
# g_hiqual_dv is "Highest qualification" (for education)
# g_fimnlabgrs_dv is "total monthly labour income - gross",
and g_fimnlabgrs_if "imputation flag - fimnlabgrs_dv"
# g_fimngrs_dv is "total personal income - gross",
g_fimngrs_if "imputation flag - fimngrs_dv"
# g_envhabit...  environmental habits: ...
# g_envtax_...   environmental tax version...
# g_opecl
# g_ldsmrt_...   leaders smart version ...
# g_ldcrkd_...   leaders crooked version ...
# g_qfhigh
# g_vote1  supports a particular political party
# g_vote2  closer to one political party than others
# g_vote3  party would vote for tomorrow
# g_vote4  which political party closest to
# g_vote5  strength of support for stated party
# g_vote6  level of interest in politics
# g_vote3_all    party would vote for
# g_vote4_all    party supported
# g_worktrav     mode of transport for journey to work
# g_jsworktrav   s/emp: mode of transport to work
# g_caruse has use of car or van
# g_avtemp_...   average temperatures version ...
# g_jobsw7 jobs experimental treatment
# g_jobs_...     jobs version ...
# g_adqhousw7    adqhouse experimental treatment
```

```
# g_adqhous_...  adequate housing version ...
# g_racel_dv     Ethnic Group
# g_istrtdaty    interview start date (year)
# g_istrtdatm    interview start date (month)
# g_istrtdatd    interview start date (day)
# g_indmode      mode this individual was given final ind
outcome in (proxy, capi, cati, cawi)
# g_hhorig       sample origin (ip original sample 2008, ip4
refreshment sample 2011, or ip7 refreshment sample 2014)
# g_sex          sex
# g_dvage  age in years

hhsamp <- data.frame(read.dta13("g_hhsamp_ip.dta")) # Sample
and Household level data for 3002 issued households
hhsamp <- subset(hhsamp, select=c(g_hidp, g_hhintmode,
g_urban_dv, g_ivfho, g_ivfhqo, grep("tax", names(hhsamp))))
# g_hhintmode    mode for the completion of the household
interview
# g_urban_dv     Urban or rural area, derived
# g_ivfho  final household interview outcome (all eligible
interviewed, interviews + proxies, etc.)
# g_ivfhqo hh interview completed
# g_ff_envtaxqw7

hhresp <- data.frame(read.dta13("g_hhresp_ip.dta")) #
Household data from 1407 respondent households
hhresp <- subset(hhresp, select=c(g_hidp, g_hhsize,
g_nkids015, grep("car", names(hhresp)), grep("fihhmngrs",
names(hhresp))))
# g_hhsize number of people in household
# g_nkids015     number of children aged 0-15 in hhold
# g_ncars  number of cars in household("How many cars or vans
in total does your household own or have continuous use of?")
# g_carown household member owns vehicle    ("Do (any of) you
own this/these vehicle(s) or is it a company vehicle?")
# g_carval
# g_fihhmngrs_dv is gross household income: month before
interview
# g_fihhmngrs_if is "imputation flag - g_fihhmngrs_dv"

ip7 <- merge(indresp, hhsamp) # 2413 rows
ip7 <- merge(ip7, hhresp, all.x=T) # all.x to catch 87
individuals in hholds with "hh grid + indiv interviews only"
for g_ivfho (g_ivfhqo no)

dim(ip7) # 2413 individual respondents
table(ip7$g_hhorig) # 1168 in ip original sample 2008, 557 in
ip4 refreshment sample 2011, and 688 in ip7 refreshment sample
2014
table(ip7$g_indmode) # 76 by proxy, 1581 CAPI, 4 CATI, and 752
CAWI
table(ip7$g_ivfhqo) # 87 come from households that did not
provide a household interview, 2326 come from households that
did
table(ip7$g_istrtdatm) # May to November 2014
table(table(ip7$g_hidp)) # 657 households of 1, 612 of 2, 112
of 3, 35 of 4, 10 of 5, 1 of 6
```

```
envtax <- apply(ip7[,grep("envtax", names(ip7))], 1,
function(x) x[which(x %in% c("not at all willing", "not very
willing", "fairly willing", "very willing"))])
ip7$envtax <- factor(sapply(envtax, function(x)
ifelse(length(x)==0, NA, x)), ordered=T, levels=c("not at all
willing", "not very willing", "fairly willing", "very
willing"))

colSums(do.call(rbind, lapply(grep("envtax",
names(ip7))[1:10], function(x) table(ip7[,x]))))
# 15 missing, 4 refused, 83 don't know (aside from 76 proxy)
which(apply(ip7[,grep("envtax", names(ip7))[1:10]], 1,
function(x) length(unique(x)))==3) # one missing that isn't,
so 14

# for clarity of presentation, the paper treats versions 1 to
10 of treat as, in order: a b g h i j c d e f

ip7$treat <- as.numeric(ip7$g_ff_envtaxqw7)-4
ip7$pet <- ifelse(ip7$treat %in% c(9,10), 1, 0)
ip7$off <- ifelse(ip7$treat %in% c(2,4,6,8,10), 1, 0)
ip7$prom <- ifelse(ip7$treat %in% c(5,6), 1, 0)
ip7$buy <- ifelse(ip7$treat %in% c(7,8,9,10), 1, 0)
ip7$spen <- ifelse(ip7$treat %in% c(3,4,5,6), 1, 0)

# "Do you feel that almost all of the people running the
government are smart people..." (4 versions of ldsmrt)
ip7$ldsmrt <- apply(ip7[,grep("ldsmrt", names(ip7))], 1,
function(x) which(x[1:length(x)] %in% c("are smart", "they
don't know what they're doing")))
ip7$ldsmrt <- sapply(ip7$ldsmrt, function(x)
ifelse(is.null(x), NA, x))
ip7$ldsmrt <- unlist(apply(ip7[,grep("ldsmrt", names(ip7))],
1, function(x) x[as.numeric(x["ldsmrt"])]))
ip7$ldsmrt <- factor(ip7$ldsmrt, levels=c("they don't know
what they're doing", "are smart"))

# "Do you think that quite a few of the people running the
government are corrupt, not very many are, hardly any of them
are corrupt..." (4 versions of dcrkd)
ip7$dcrkd <- apply(ip7[,grep("dcrkd", names(ip7))], 1,
function(x) which(x[1:length(x)] %in% c("hardly any", "not
many", "quite a few")))
ip7$dcrkd <- sapply(ip7$dcrkd, function(x) ifelse(is.null(x),
NA, x))
ip7$dcrkd <- unlist(apply(ip7[,grep("dcrkd", names(ip7))], 1,
function(x) x[as.numeric(x["dcrkd"])]))
ip7$dcrkd <- factor(ip7$dcrkd, levels=c("hardly any", "not
many", "quite a few"))

# gov responsibility for adequate housing (4 versions of
adqhous)
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==1,
as.numeric(g_adqhous_a=="government should see to adequate
housing"), NA))
```

```
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==2,
as.numeric(g_adqhous_b=="government should see to adequate
housing"), adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==3,
as.numeric(g_adqhous_c=="government should see to adequate
housing"), adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==4,
as.numeric(g_adqhous_d=="government should see to adequate
housing"), adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==1 &
g_adqhous_a %in% c("missing", "inapplicable", "proxy",
"spontaneous - skip question"), NA, adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==2 &
g_adqhous_b %in% c("missing", "inapplicable", "proxy",
"spontaneous - skip question"), NA, adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==3 &
g_adqhous_c %in% c("missing", "inapplicable", "proxy",
"spontaneous - skip question"), NA, adqhous))
ip7 <- within(ip7, adqhous <- ifelse(g_adqhousw7==4 &
g_adqhous_d %in% c("missing", "inapplicable", "proxy",
"spontaneous - skip question"), NA, adqhous))

# gov responsibility for jobs (4 versions of g_jobsw7)
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==1,
as.numeric(g_jobs_a=="government should see to it"), NA))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==2,
as.numeric(g_jobs_b=="agree"), jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==3,
as.numeric(g_jobs_c=="disagree"), jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==4,
as.numeric(g_jobs_d=="government should see to it"), jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==1 & g_jobs_a %in%
c("missing", "inapplicable", "proxy", "spontaneous - skip
question"), NA, jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==2 & g_jobs_b %in%
c("missing", "inapplicable", "proxy", "spontaneous - skip
question"), NA, jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==3 & g_jobs_c %in%
c("missing", "inapplicable", "proxy", "spontaneous - skip
question"), NA, jobs))
ip7 <- within(ip7, jobs <- ifelse(g_jobsw7==4 & g_jobs_d %in%
c("missing", "inapplicable", "proxy", "spontaneous - skip
question"), NA, jobs))

ip7$g_opecl30 <- factor(ifelse(ip7$g_opecl30 %in% c("yes",
"no"), ip7$g_opecl30, NA), levels=c(7,6), labels=c("no",
"yes"))

ip7$cynic <- (as.numeric(ip7$dcrkd)-1)/4 + (2-
as.numeric(ip7$ldsmrt))/2
ip7$noncynic <- 1-ip7$cynic
ip7$g_vote4 <- factor(ip7$g_vote4)
# see also Vote1, Vote2, Vote3
ip7 <- within(ip7, soc <- (jobs + adqhous)/2)

ip7 <- within(ip7, qual <- factor(g_hiqual_dv))
levels(ip7$qual)[1] <- NA
```

```
ip7 <- within(ip7, inc <-
(g_fihhmngrs_dv/1000)/sqrt(g_hhsize))
ip7 <- within(ip7, rural <- g_urban_dv=="rural area")

ip7$gw <- ifelse(ip7$g_avtemp_a %in% c("lower", "higher",
"about the same"), levels(ip7$g_avtemp_a)[ip7$g_avtemp_a], NA)
ip7$gw[is.na(ip7$gw)] <- ifelse(ip7$g_avtemp_b %in% c("lower",
"higher", "about the same"),
levels(ip7$g_avtemp_b)[ip7$g_avtemp_b], NA)[is.na(ip7$gw)]
# (""would you say that average temperatures around the
world..."")
ip7$gw2 <- as.numeric(ip7$gw=="higher")
ip7$gw <- factor(ip7$gw, ordered=T, levels=c("lower", "about
the same", "higher"))

ip7 <- within(ip7, car <- ifelse(g_ncars<0, NA,
as.numeric(g_ncars>0)))
ip7 <- within(ip7, clim <- ((as.numeric(g_opecl30)-
1)/2)+((as.numeric(gw)-1)/4))
ip7 <- within(ip7, male <- g_sex=="male")
ip7 <- within(ip7, polint <- ifelse(g_vote6 %in% c("very",
"fairly", "not very", "or not at all interested?"), 9-
as.numeric(g_vote6), NA))
ip7 <- within(ip7, age <- g_dvage-min(g_dvage))
ip7 <- within(ip7, torylab <- ifelse(g_vote4=="conservative",
1, ifelse(g_vote4=="labour", 0, NA)))

###### preliminary analyses

GKgamma(with(ip7, table(ldsmrt, dcrkd))) # -0.522
GKgamma(with(ip7, table(jobs, adqhous))) # 0.453
GKgamma(with(ip7, table(cynic, soc))) # 0.095

by(ip7, ip7$jobs, function(x) mean(as.numeric(x$envtax),
na.rm=T))
by(ip7, ip7$g_vote4, function(x) mean(x$jobs, na.rm=T))
by(ip7, ip7$g_vote4, function(x) mean(x$soc, na.rm=T))
by(ip7, ip7$g_vote4, function(x) mean(as.numeric(x$envtax),
na.rm=T))
by(ip7, ip7$g_vote4, function(x) mean(x$cynic, na.rm=T)) #
Tory 0.59 (N= 436), Labour 0.67 (N= 461), LibDem 0.59

GKgamma(with(ip7, table(cynic, polint))) # -0.198
GKgamma(with(ip7, table(envtax, polint))) # 0.202
GKgamma(with(ip7, table(soc, polint))) # 0.048
GKgamma(with(ip7, table(g_opecl30, gw))) # 0.559
GKgamma(with(ip7, table(cynic, soc))) # 0.095

plotage <- within(na.omit(subset(ip7, select=c(envtax, age))),
agesm <- predict(loess(as.numeric(envtax)~age), age))
plot(unique(plotage[,2:3]))
plot(by(ip7, ip7$age, function(x) mean(as.numeric(x$envtax),
na.rm=T)))

plot(by(ip7, ip7$clim, function(x) mean(as.numeric(x$envtax),
na.rm=T)))
```

```
round(t(apply(with(ip7, table(g_ff_envtaxqw7, envtax)), 1,
function(x) 100*(x/sum(x))))[-c(1:4),]) # for Table 1
rowSums(with(ip7, table(g_ff_envtaxqw7, envtax))[-c(1:4),]) #
Ns for Table 1

summary(ip7[,grep("ldsmrt_", names(ip7))])
summary(ip7[,grep("avtemp_", names(ip7))])
summary(ip7[,grep("ldcrkd_", names(ip7))])
summary(ip7[,grep("jobs_", names(ip7))])
summary(ip7[,grep("adqhous_", names(ip7))])

ip7$pid <- ifelse(ip7$g_vote4 %in% c("conservative",
"labour"), levels(ip7$g_vote4)[ip7$g_vote4], NA)
ip7$pid <- ifelse(ip7$g_vote4 %in% c("plaid cymru", "green
party", "british national party", "scottish national party",
"liberal democrat"), "other party", ip7$pid)

# for Table B1:
t(round(apply(subset(ip7, select=c(age, inc, male, rural,
cynic, clim, soc, adqhous, jobs, polint)), 2, function(x)
c(mean(x, na.rm=T), range(x, na.rm=T), length(unique(x))-
any(is.na(x)), length(x)-sum(is.na(x)), sd(x, na.rm=T))), 2))
round(t(sapply(subset(ip7, select=c(ldsmrt, dcrkd, g_opecl30,
gw)), function(x) c(mean(as.numeric(x), na.rm=T),
range(as.numeric(x), na.rm=T), length(unique(x))-
any(is.na(x)), length(x)-sum(is.na(x)), sd(as.numeric(x),
na.rm=T)))), 2)
round(t(apply(model.matrix( ~ qual - 1, data=ip7), 2,
function(x) c(mean(x, na.rm=T), range(x, na.rm=T),
length(unique(x))-any(is.na(x)), length(x)-sum(is.na(x)))),
2)
round(t(apply(model.matrix( ~ pid - 1, data=ip7), 2,
function(x) c(mean(x, na.rm=T), range(x, na.rm=T),
length(unique(x))-any(is.na(x)), length(x)-sum(is.na(x)))),
2)

# for Table B1 (means) equivalent by treatment groups (age inc
male rural cynic clim soc adqhous jobs polint ldsmrt dcrkd
g_opecl30 gw qualDegree qualOther higher degree qualA-level
qualGCSE qualOther qualification qualNo qualification
pidconservative pidlabour pidother party)

mnbygrp <- do.call(cbind, by(ip7, ip7$treat, function(TT) {
     c(t(round(apply(subset(TT, select=c(age, inc, male,
rural, cynic, clim, soc, adqhous, jobs, polint)), 2,
function(x) c(mean(x, na.rm=T))), 2)),
     round(t(sapply(subset(TT, select=c(ldsmrt, dcrkd,
g_opecl30, gw)), function(x) c(mean(as.numeric(x)-1,
na.rm=T)))), 2),
     round(t(apply(model.matrix( ~ qual - 1, data=TT), 2,
function(x) c(mean(x, na.rm=T)))), 2),
     round(t(apply(model.matrix( ~ pid - 1, data=TT), 2,
function(x) c(mean(x, na.rm=T)))), 2))
     }))
colnames(mnbygrp) <- c("a", "b", "g", "h", "i", "j", "c", "d",
"e", "f")
```

```
sdbygrp <- do.call(cbind, by(ip7, ip7$treat, function(TT) {
     c(t(round(apply(subset(TT, select=c(age, inc, male,
rural, cynic, clim, soc, adqhous, jobs, polint)), 2,
function(x) c(sd(x, na.rm=T))), 2)),
     round(t(sapply(subset(TT, select=c(ldsmrt, dcrkd,
g_opecl30, gw)), function(x) c(sd(as.numeric(x)-1,
na.rm=T)))), 2),
     round(t(apply(model.matrix( ~ qual - 1, data=TT), 2,
function(x) c(sd(x, na.rm=T)))), 2),
     round(t(apply(model.matrix( ~ pid - 1, data=TT), 2,
function(x) c(sd(x, na.rm=T)))), 2))
     }))
colnames(sdbygrp) <- c("a", "b", "g", "h", "i", "j", "c", "d",
"e", "f")
bygrp <- lapply(colnames(mnbygrp), function(x)
data.frame(as.list(data.frame(mnbygrp))[x],
as.list(data.frame(sdbygrp))[x]))
sapply(bygrp, function(x) apply(x, 1, function(xx)
paste(paste(xx[1], xx[2], sep=" ("), ")", sep="")))

with(ip7[ip7$treat %in% c(4,6),], table(treat, envtax))
rowSums(with(ip7[ip7$treat %in% c(4,6),], table(treat,
envtax)))


###### modelling

# Model B1: just with "treat" as a factor:
ip7mod1 <- MCMCglmm(envtax ~ as.factor(treat), random=~g_hidp,
data=na.omit(subset(ip7, select=c(envtax, treat, g_hidp))),
family="threshold", prior=list(R=list(V=1, fix=1), G = list(G1
= list(V=1, nu=0.02))), nitt=105000, thin=50, burnin=5000)

# model parameterising combinations of treatments,
substantively:
ip7mod2 <- MCMCglmm(envtax ~ pet + off*prom + buy + spen,
random=~g_hidp, data=na.omit(subset(ip7, select=c(envtax, pet,
off, prom, buy, spen, g_hidp))), family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), nitt=105000, thin=50, burnin=5000)

# an observational model of envtax, with just demographics:
ip7mod3 <- MCMCglmm(envtax ~ qual + inc + rural + male + age,
random=~g_hidp, family="threshold", prior=list(R=list(V=1,
fix=1), G = list(G1 = list(V=1, nu=0.02))),
data=na.omit(subset(ip7, select=c(g_hidp, envtax, qual, inc,
rural, male, age, clim, soc, cynic, polint))), nitt=105000,
thin=50, burnin=5000)

# an observational model of envtax, with demographics plus
some key attitudinal covariates:
ip7mod4 <- MCMCglmm(envtax ~ qual + inc + rural + male + age +
clim + soc + cynic + polint, random=~g_hidp,
family="threshold", prior=list(R=list(V=1, fix=1), G = list(G1
= list(V=1, nu=0.02))), data=na.omit(subset(ip7,
select=c(g_hidp, envtax, qual, inc, rural, male, age, clim,
soc, cynic, polint))), nitt=105000, thin=50, burnin=5000)
```

```
# model to see whether treatments have more impact on people's
belief in climate change:
ip7mod5 <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*clim, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
pet, clim, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

# model to see whether treatments have more impact on
leftists:
ip7mod6 <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*soc, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
pet, soc, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

# model to see whether treatments have more impact on
non/cynics:
ip7mod7 <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*cynic, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
pet, cynic, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

ip7$dcrkdN <- (as.numeric(ip7$dcrkd)-1)/2 # to need to run
models with just dcrkd, not ldsmrt
ip7mod7B <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*dcrkdN, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
pet, dcrkdN, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

# testing scenario H versus J for cynics and non-cynics
ip7$treat6 <- as.factor(ip7$treat)
ip7$treat6 <- relevel(ip7$treat6, ref="6")
ip7mod7C <- MCMCglmm(envtax ~ treat6*cynic, random=~g_hidp,
data=na.omit(subset(ip7[ip7$treat6 %in% c("4","6"),],
select=c(g_hidp, envtax, cynic, treat6))), family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), nitt=105000, thin=50, burnin=5000)
ip7mod7D <- MCMCglmm(envtax ~ treat6*noncynic, random=~g_hidp,
data=na.omit(subset(ip7[ip7$treat6 %in% c("4","6"),],
select=c(g_hidp, envtax, noncynic, treat6))),
family="threshold", prior=list(R=list(V=1, fix=1), G = list(G1
= list(V=1, nu=0.02))), nitt=105000, thin=50, burnin=5000)

# model to see whether treatments have more impact on people
depending on interest in politics:
ip7mod8 <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*polint, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
```

```
pet, polint, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

# model to see whether treatments have more or less impact by
party identification (Labour/Conservative):
ip7mod9 <- MCMCglmm(envtax ~ (pet + off*prom + buy +
spen)*torylab, random=~g_hidp, family="threshold",
prior=list(R=list(V=1, fix=1), G = list(G1 = list(V=1,
nu=0.02))), data=na.omit(subset(ip7, select=c(g_hidp, envtax,
pet, torylab, off, prom, buy, spen))), nitt=105000, thin=50,
burnin=5000)

# model to see whether the difference between J and H alone is
significant (reported in appendix)
ip7mod10 <- MCMCglmm(envtax ~ as.factor(treat),
random=~g_hidp, data=na.omit(subset(ip7[ip7$treat %in%
c(4,6),], select=c(envtax, treat, g_hidp))),
family="threshold", prior=list(R=list(V=1, fix=1), G = list(G1
= list(V=1, nu=0.02))), nitt=105000, thin=50, burnin=5000)

modprint <- function(mod) {
     out1 <- colMeans(mod$Sol)
     out2 <- apply(mod$Sol, 2, function(x) min(c(mean(x<0),
mean(x>0))))
     out3 <- matrix(apply(cbind(as.numeric(out1),
as.numeric(out2)), 1, function(x) paste(sprintf("%.2f", x[1]),
symnum(x[2], cut = c(0, 0.01, 0.05, 1), c("**", "*", "")),
"(", sprintf("%.2f", round(x[2],2)), ")", sep="")))
     out4 <- colMeans(sqrt(mod$VCV))
     out5 <- colMeans(mod$CP)
     out3 <- data.frame(nam=names(out1), out3)
     list(FE = out3, RE = data.frame(names(out4),
sprintf("%.2f", out4)), CP = data.frame(names(out5),
sprintf("%.2f", out5)), DIC=mod$DIC, N=paste(mod$Random$nrl,
mod$Residual$nrl, sep=", "))
     }

modprint(ip7mod1)
modprint(ip7mod2)
modprint(ip7mod3)
modprint(ip7mod4)
modprint(ip7mod5)
modprint(ip7mod6)
modprint(ip7mod7)
modprint(ip7mod8)
modprint(ip7mod9)

####### plotting

toplot1 <- cbind(-Inf, 0, ip7mod1$CP, Inf, ip7mod1$Sol %*%
rbind(1, diag(10)[-1,]))
toplot1 <- t(apply(toplot1, 1, function(xx) sapply(1:10,
function(x, y) diff(pnorm(xx[1:5], mean=y[x])), y=xx[6:15])))
toplot1 <- apply(toplot1, 2, function(x) c(mean(x),
quantile(x, c(0.025, 0.975))))
```

```
toplot1 <- data.frame(prob=t(toplot1),
resp=rep(levels(ip7$envtax), 10), treat=rep(letters[1:10],
each=4))
toplot1$resp <- factor(toplot1$resp, levels =
levels(ip7$envtax))
levels(toplot1$treat) <- c("(A)\n(Base)", "(B)\n Offset",
"(C)\nSpent", "(D)\nSpent+Offset", "(E)\nSpent+Promised",
"(F)\nSpent+Offset+Promised", "(G)\nBuy", "(H)\nBuy+Offset",
"(I)\nBuy+Petrol", "(J)\nBuy+Offset+Petrol")
toplot1$treat <- factor(toplot1$treat,
levels=levels(toplot1$treat)[c(1,3,5,7,9,2,4,6,8,10)])
ggplot(toplot1, aes(resp, prob.V1, fill=treat)) +
geom_bar(stat="identity") +  facet_wrap(~ treat, ncol=5) +
theme(legend.position="none", axis.text.y =
element_text(colour="black", size=12), axis.text.x =
element_text(colour="black", angle = 45, hjust = 1, size=12),
strip.text.x = element_text(colour="black", size = 12)) +
ylab("Expected Proportions") + xlab("") +
geom_errorbar(aes(ymin= prob.2.5., ymax=prob.97.5., alpha=0.5,
width=0.25))
ggsave("ip7mod1.pdf", width=12, height=8.25)


newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod2$Fixed$formula)))))
newdata <- unique(model.matrix(ip7mod2$Fixed$formula, data =
newdata))
toplotmod2 <- cbind(-Inf, 0, ip7mod2$CP, Inf, ip7mod2$Sol %*%
t(newdata))
toplotmod2 <- t(apply(toplotmod2, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod2 <- 1-toplotmod2[,c(3+(0:((ncol(toplotmod2)/5)-
1))*5)]
toplotmod2 <- data.frame(prob=colMeans(toplotmod2),
t(apply(toplotmod2, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod2 <- data.frame(newdata, toplotmod2,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod2$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod2 <- merge(toplotmod2, treats)
toplotmod2$inter <- 1
toplotmod2$intervar <- "All Britons"
toplotmod2 <- subset(toplotmod2, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod2$grp <- "All (Model 3)"

newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod5$Fixed$formula)))))
```

```
newdata <- unique(model.matrix(ip7mod5$Fixed$formula, data =
newdata))
toplotmod5 <- cbind(-Inf, 0, ip7mod5$CP, Inf, ip7mod5$Sol %*%
t(newdata))
toplotmod5 <- t(apply(toplotmod5, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod5 <- 1-toplotmod5[,c(3+(0:((ncol(toplotmod5)/5)-
1))*5)]
toplotmod5 <- data.frame(prob=colMeans(toplotmod5),
t(apply(toplotmod5, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod5 <- data.frame(newdata, toplotmod5,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod5$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod5 <- merge(toplotmod5, treats)
toplotmod5 <- merge(toplotmod5,
data.frame(combo=rownames(newdata),
inter=newdata[,"clim"]/max(newdata[,"clim"])))
toplotmod5 <- toplotmod5[toplotmod5$inter %in% c(0,1),]
toplotmod5$intervar <- ifelse(toplotmod5$inter, "Believer",
"Sceptic")
toplotmod5 <- subset(toplotmod5, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod5$grp <- "Belief in Climate Science (Model 4)"

newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod6$Fixed$formula)))))
newdata <- unique(model.matrix(ip7mod6$Fixed$formula, data =
newdata))
toplotmod6 <- cbind(-Inf, 0, ip7mod6$CP, Inf, ip7mod6$Sol %*%
t(newdata))
toplotmod6 <- t(apply(toplotmod6, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod6 <- 1-toplotmod6[,c(3+(0:((ncol(toplotmod6)/5)-
1))*5)]
toplotmod6 <- data.frame(prob=colMeans(toplotmod6),
t(apply(toplotmod6, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod6 <- data.frame(newdata, toplotmod6,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod6$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
```

```
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod6 <- merge(toplotmod6, treats)
toplotmod6 <- merge(toplotmod6,
data.frame(combo=rownames(newdata),
inter=newdata[,"soc"]/max(newdata[,"soc"])))
toplotmod6 <- toplotmod6[toplotmod6$inter %in% c(0,1),]
toplotmod6$intervar <- ifelse(toplotmod6$inter, "Left",
"Right/Liberal")
toplotmod6 <- subset(toplotmod6, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod6$grp <- "Economic Ideology (Model 5)"

newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod7$Fixed$formula)))))
newdata <- unique(model.matrix(ip7mod7$Fixed$formula, data =
newdata))
toplotmod7 <- cbind(-Inf, 0, ip7mod7$CP, Inf, ip7mod7$Sol %*%
t(newdata))
toplotmod7 <- t(apply(toplotmod7, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod7 <- 1-toplotmod7[,c(3+(0:((ncol(toplotmod7)/5)-
1))*5)]
toplotmod7 <- data.frame(prob=colMeans(toplotmod7),
t(apply(toplotmod7, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod7 <- data.frame(newdata, toplotmod7,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod7$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod7 <- merge(toplotmod7, treats)
toplotmod7 <- merge(toplotmod7,
data.frame(combo=rownames(newdata),
inter=newdata[,"cynic"]/max(newdata[,"cynic"])))
toplotmod7 <- toplotmod7[toplotmod7$inter %in% c(0,1),]
toplotmod7$intervar <- ifelse(toplotmod7$inter, "Cynics",
"Non-Cynics")
toplotmod7 <- subset(toplotmod7, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod7$grp <- "Political Cynicism (Model 6)"

newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod8$Fixed$formula)))))
newdata <- unique(model.matrix(ip7mod8$Fixed$formula, data =
newdata))
toplotmod8 <- cbind(-Inf, 0, ip7mod8$CP, Inf, ip7mod8$Sol %*%
t(newdata))
```

```
toplotmod8 <- t(apply(toplotmod8, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod8 <- 1-toplotmod8[,c(3+(0:((ncol(toplotmod8)/5)-
1))*5)]
toplotmod8 <- data.frame(prob=colMeans(toplotmod8),
t(apply(toplotmod8, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod8 <- data.frame(newdata, toplotmod8,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod8$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod8 <- merge(toplotmod8, treats)
toplotmod8 <- merge(toplotmod8,
data.frame(combo=rownames(newdata),
inter=newdata[,"polint"]/max(newdata[,"polint"])))
toplotmod8 <- toplotmod8[toplotmod8$inter %in% c(0,1),]
toplotmod8$intervar <- ifelse(toplotmod8$inter, "Interested",
"Uninterested")
toplotmod8 <- subset(toplotmod8, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod8$grp <- "Interest in Politics (Model 7)"

newdata <- na.omit(unique(subset(ip7,
select=c(all.vars(ip7mod9$Fixed$formula)))))
newdata <- unique(model.matrix(ip7mod9$Fixed$formula, data =
newdata))
toplotmod9 <- cbind(-Inf, 0, ip7mod9$CP, Inf, ip7mod9$Sol %*%
t(newdata))
toplotmod9 <- t(apply(toplotmod9, 1, function(xx)
sapply(1:nrow(newdata), function(x, y) pnorm(xx[1:5],
mean=y[x]), y=xx[6:55])))
toplotmod9 <- 1-toplotmod9[,c(3+(0:((ncol(toplotmod9)/5)-
1))*5)]
toplotmod9 <- data.frame(prob=colMeans(toplotmod9),
t(apply(toplotmod9, 2, function(x) quantile(x, c(0.025,
0.975)))))
toplotmod9 <- data.frame(newdata, toplotmod9,
combo=rownames(newdata))
treats <- unique(na.omit(ip7[,c("g_ff_envtaxqw7",
names(ip7)[names(ip7) %in%
all.vars(ip7mod9$Fixed$formula)])]))[,-c(2,8)]
rownames(treats) <- 1:nrow(treats)
treats <- unique(treats)
treats$treat <- factor(c("(Base)", "Offset", "Spent",
"Spent+Offset", "Spent+Promised", "Spent+Offset+Promised",
"Buy", "Buy+Offset", "Buy+Petrol",
"Buy+Offset+Petrol")[rank(treats$g_ff_envtaxqw7)])
toplotmod9 <- merge(toplotmod9, treats)
```

```
toplotmod9 <- merge(toplotmod9,
data.frame(combo=rownames(newdata),
inter=newdata[,"torylab"]/max(newdata[,"torylab"])))
toplotmod9 <- toplotmod9[toplotmod9$inter %in% c(0,1),]
toplotmod9$intervar <- ifelse(toplotmod9$inter,
"Conservative", "Labour")
toplotmod9 <- subset(toplotmod9, select=c(intervar, prob,
treat, X2.5., X97.5.))
toplotmod9$grp <- "Party Identification (Model 8)"

toplot <- rbind(toplotmod2, toplotmod5, toplotmod6,
toplotmod7, toplotmod8, toplotmod9)

toplot <- toplot[toplot$treat %in%
levels(toplot$treat)[which(levels(toplot$treat) %in%
c("(Base)", "Buy", "Buy+Petrol", "Spent", "Offset",
"Spent+Offset+Promised"))],]
toplot$treat <- factor(toplot$treat, levels=c("(Base)", "Buy",
"Buy+Petrol", "Spent", "Offset", "Spent+Offset+Promised"))
toplot$treat <- factor(toplot$treat)

toplot$grp <- factor(toplot$grp, levels=c("All (Model 3)",
"Belief in Climate Science (Model 4)", "Economic Ideology
(Model 5)", "Political Cynicism (Model 6)", "Interest in
Politics (Model 7)", "Party Identification (Model 8)"))

gg_color_hue <- function(n) {
  hues = seq(15, 375, length = n + 1)
  hcl(h = hues, l = 65, c = 100)[1:n]
}

cols <- gg_color_hue(n = length(unique(toplot$intervar)))

qplot(treat, prob, group=intervar, data=toplot)  +
scale_y_continuous(labels = scales::percent) +
geom_line(aes(col=intervar)) + geom_point(aes(col=intervar),
size=3) + geom_errorbar(aes(col=intervar, ymin = X2.5., ymax =
X97.5.), width=0.05) +  facet_wrap(~ grp, ncol=2) +
ylab("Probability of Being Willing to Pay Higher Taxes") +
xlab("") + theme(legend.position="none", axis.text.y =
element_text(colour="black", size=14), axis.text.x =
element_text(colour="black", angle = 30, hjust = 1, size=14),
axis.text.y = element_text(colour="black", size=14),
strip.text = element_text(colour="black", size=14), title =
element_text(colour="black", size=14)) +
geom_label_repel(data=toplot[toplot$treat=="Spent+Offset+Promi
sed",], aes(label=intervar), nudge_x=1, segment.size = 0,
size=5) + expand_limits(x=8, y=1) +
scale_color_manual(values=cols[c(4,11,1,9,8,5,10,7,2,6,3)])

ggsave("ip7interacts.pdf", width=12, height=8.25)

cols <- rep("#000000", length(unique(toplot$intervar)))

qplot(treat, prob, group=intervar, data=toplot)  +
scale_y_continuous(labels = scales::percent) +
geom_line(aes(col=intervar)) + geom_point(aes(shape=intervar),
```

```
size=3) + geom_errorbar(aes(col=intervar, ymin = X2.5., ymax =
X97.5.), width=0.05) +  facet_wrap(~ grp, ncol=2) +
ylab("Probability of Being Willing to Pay Higher Taxes") +
xlab("") + theme(legend.position="none", axis.text.y =
element_text(colour="black", size=14), axis.text.x =
element_text(colour="black", angle = 30, hjust = 1, size=14),
axis.text.y = element_text(colour="black", size=14),
strip.text = element_text(colour="black", size=14), title =
element_text(colour="black", size=14)) +
geom_label_repel(data=toplot[toplot$treat=="Spent+Offset+Promi
sed",], aes(label=intervar), nudge_x=1, segment.size = 0,
size=5) + expand_limits(x=8, y=1) +
scale_color_manual(values=cols[c(4,11,1,9,8,5,10,7,2,6,3)]) +
scale_shape_manual(values=c(15,17,19,19,17,17,17,17,19,19,19))
+ theme(strip.background = element_rect(fill="white"),
panel.background = element_rect(fill="white"),
panel.grid.major.y =  element_line(colour = "grey80"),
panel.grid.minor.y =  element_line(colour = "grey80", size =
0.25))

ggsave("ip7interacts.BW.pdf", width=12, height=8.25)
```