

Multidimensional spatial voting with non-separable preferences

Supplementary Materials

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I. AUXILLIARY MATERIAL: MONTE CARLO EXPERIMENT

SAMPLING DISTRIBUTION OF NON-SEPARABILITY PARAMETER

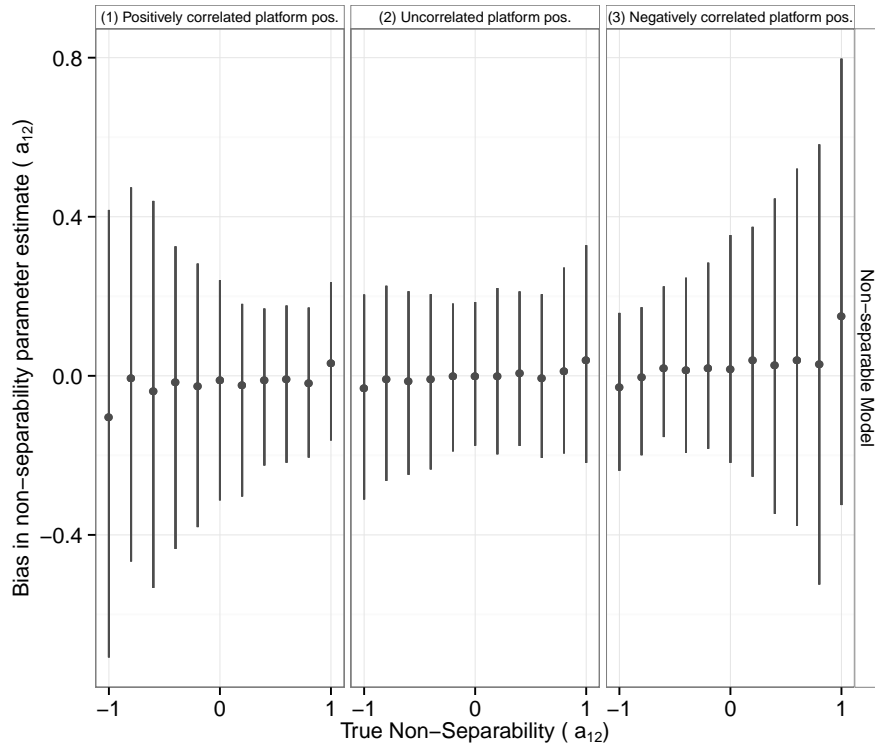


Figure 1: Monte Carlo Experiment: Dots indicate mean non-separability parameter estimates (a_{12}). Vertical bars depict 90% range of all estimates from Monte Carlo samples. (1) Platform positions randomly drawn from bivariate normal with positive covariance terms ($\rho = .8$), (2) Platform positions randomly drawn from bivariate normal with zero covariance terms ($\rho = 0$), (3) Platform positions randomly drawn from bivariate normal with negative covariance terms ($\rho = -.8$). Voter ideal points are drawn from a bivariate standard normal distribution.

ROOT MEAN SQUARE ERROR

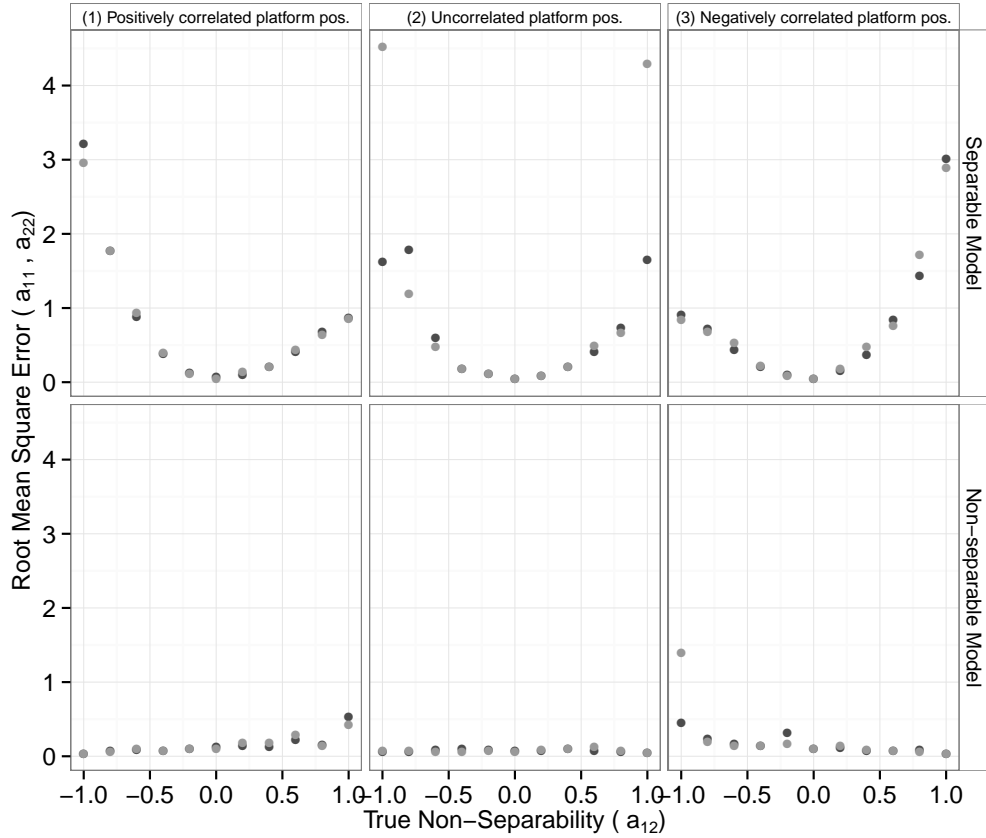


Figure 2: Monte Carlo Experiment: Root mean square error (RMSE) in salience parameter estimates. Dots indicate RMSE of salience parameters a_{11} (Dark gray) and a_{22} (Light gray).

CORRECTLY PREDICTED VOTING DECISIONS

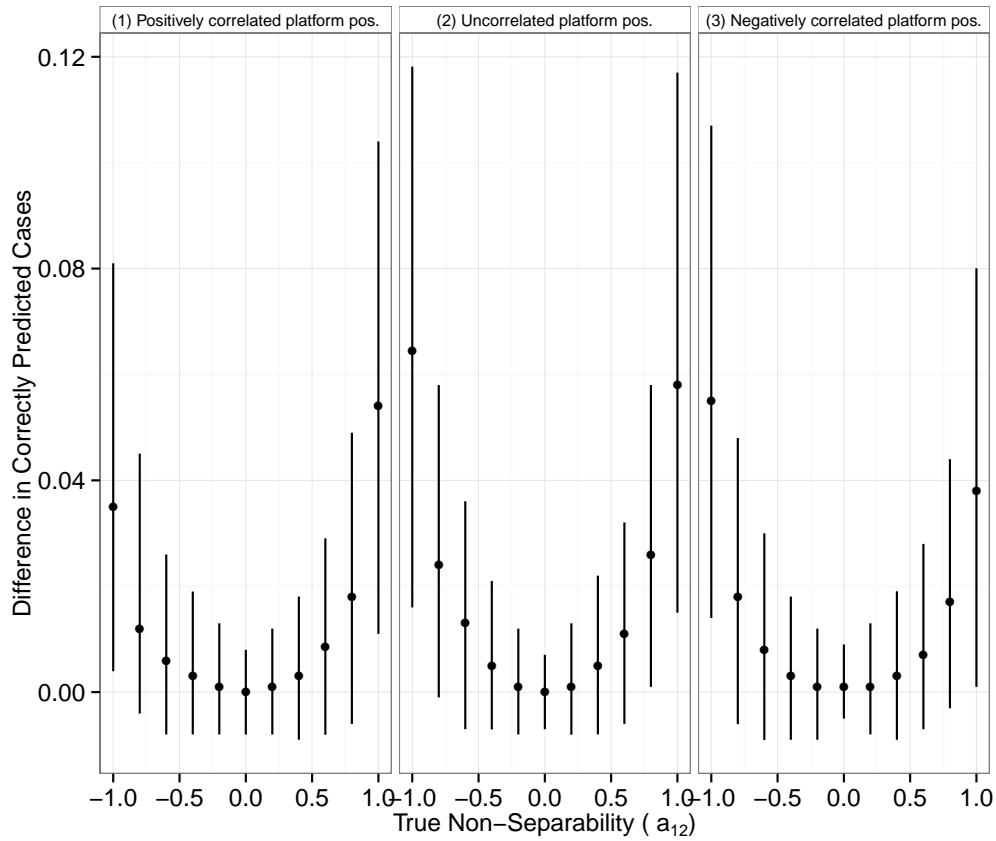


Figure 3: Monte Carlo Experiment: Difference in correctly predicted voting decisions between non-separable model to separable model. Dots indicate median difference. Vertical bars depict 90% range over Monte Carlo samples.

II. AUXILLIARY MATERIAL: DATA

NETHERLANDS 1979

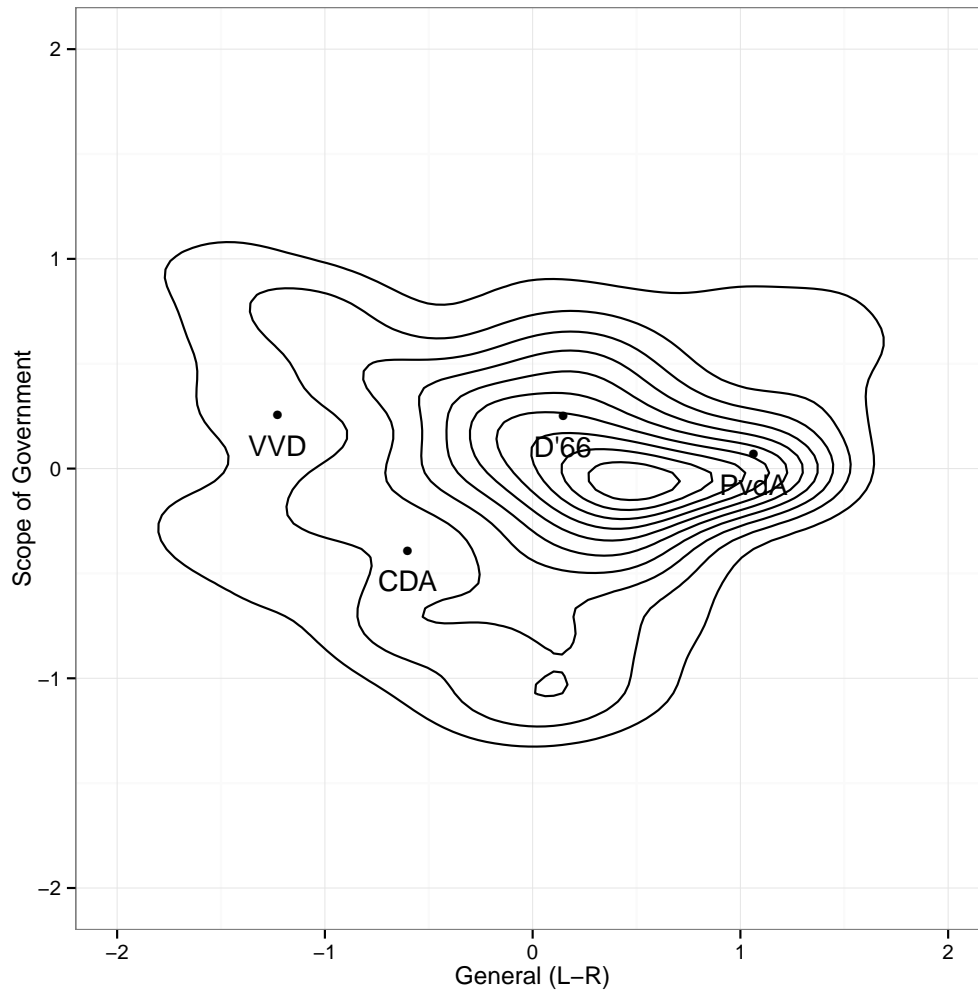


Figure 4: Distribution of voter ideal points and party positions

Issue	Euro-Barometer	Question EPPMLE Question
Public Control of Private Enterprise	public ownership of private industry should be expanded control over private industry	reduce the capacity of public control over private industry
Abortion	women should be free to decide for themselves in manners concerning abortion	women should be allowed to decide matters concerning abortion
Terrorism	more severe penalties should be introduced for acts of terrorism	the most severe penalties should be introduced for acts of terrorism
Nuclear Energy	nuclear energy should be developed to meet future energy needs	nuclear energy should be developed in order to meet our future energy needs
Control of Multinational Corporations	stronger public control should be exercised over the activities of multinational corporations	there should be far more active-control over activities of multinational corporations
Environmental Protection	stronger measures should be taken to protect the environment against pollution	greater effort should be made to protect the environment
Income Redistribution	greater efforts should be made to reduce inequality of income	reduce income differences

Table 1: Overview of the items used for the factor analysis and their exact wording in the surveys.

Multidimensional spatial voting with non-separable preferences

	Dimension 1	Dimension 2
Public Control of Private Enterprise	0.297	0
Abortion	-0.612	0.229
Terrorism	-0.51	0.148
Nuclear Energy	0.232	0.253
Control of Multinational Corporation	-0.327	-0.39
Environmental Protection	-0.526	0
Income Redistribution	-0.306	0

Table 2: Factor loadings as reported by Quinn et al. (1999)

UNITED STATES PRESIDENTIAL ELECTION 2008

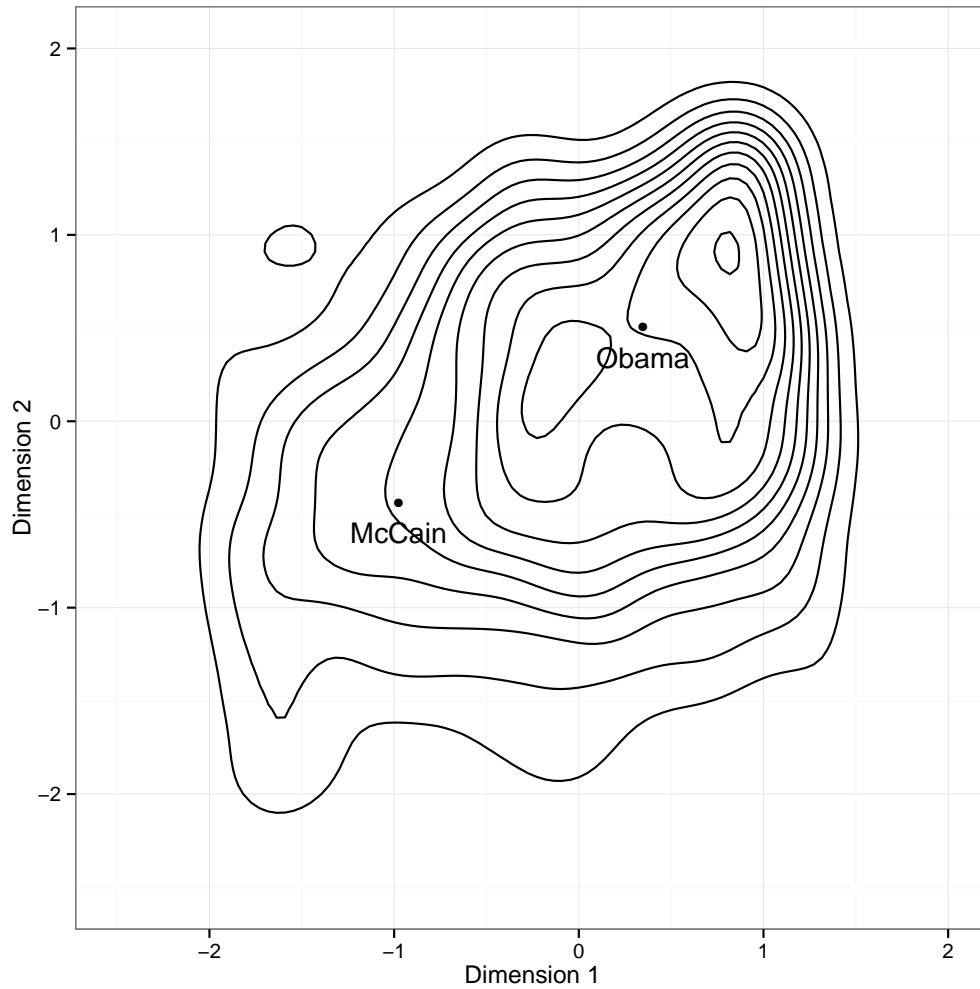


Figure 5: Distribution of voter ideal points and candidate positions

	Dimension 1	Dimension 2
raising taxes on incomes over 200k/yr	1.02	0.66
govt pay drugs for low income seniors	1.27	
govt payment for all health care	1.59	0.53
const. amendment to ban gay marriages		-0.97
suspend habeas for terror suspects		-1.12
court order to wiretap terror suspect		1.26
3 year work for illegal immigrants		0.7
illegal immigrants become citizens		1.11
RMSEA	0.09; 95% c.i. = [0.08,0.1]	

Table 3: Confirmatory Factor Analysis

Multidimensional spatial voting with non-separable preferences

	CDU	SPD	FDP	B90/Gru	Linke
Extent of public service	3	2	5	2	1
State intervention on economy	4	2	5	3	1
Redistribution of wealth	4	2	5	3	1
Punishment for crime	4	3	2	1	3
Homosexuality	4	3	2	1	2
Immigration:extent	4	3	3	1	2
Immigration:assimilation	4	3	3	1	2

Table 4: CHES party scores

GERMANY 2009

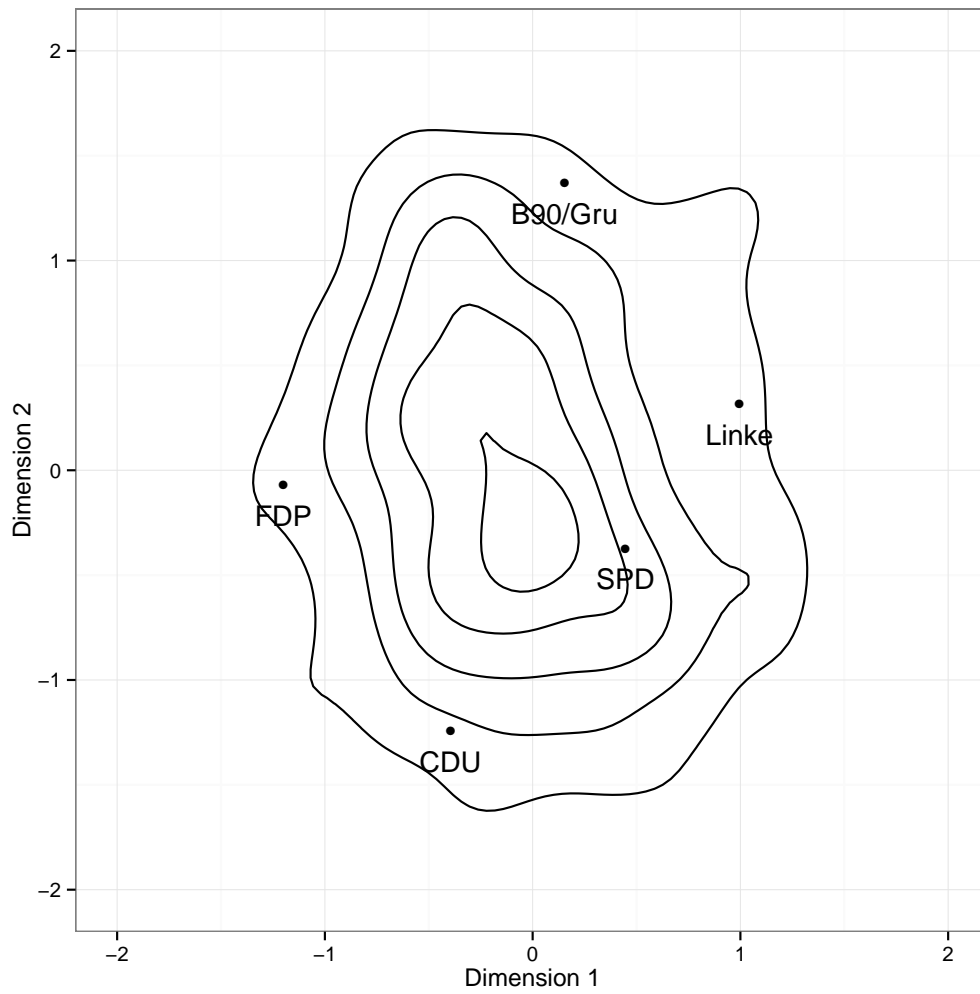


Figure 6: Distribution of voter ideal points and candidate positions

	European Election Studies (EES)	Chapel/Hill (CHESS)	short code
1	Q56. Immigrants should be required to adapt to the customs of Britain.	Q27. position on integration of immigrants and asylum seekers (0 = strongly favors multiculturalism; 10 = strongly favors assimilation)	immigration: assimilation
2	Q67. Immigration to Britain should be decreased significantly.	Q25. position on immigration policy (0 = strongly opposes tough policy; 10 = strongly favors tough policy)	immigration: extent
3	Q59. Major public services and industries ought to be in state ownership.	Q13. position on improving public services vs. reducing taxes (0 = strongly favors improving public services; 10 = strongly favors reducing taxes)	extent of public services
4	Q61. Politics should abstain from intervening in the economy.	Q15. position on deregulation (0 = strongly opposes deregulation of markets; 10 = strongly supports deregulation of markets)	state intervention on economy
5	Q63. Income and wealth should be redistributed towards ordinary people.	Q17. position on redistribution from the rich to the poor (0 = strongly favors redistribution; 10 = strongly opposes redistribution)	redistribution of wealth
6	Q62. People who break the law should be given much harsher sentences than they are these days.	Q19. position on civil liberties vs. law and order (0 = strongly promotes civil liberties; 10 = strongly supports tough measures to fight crime)	punishment for crime
7	Q58. Same-sex marriages should be prohibited by law.	Q21. position on social lifestyle (e.g. homosexuality) (0 = strongly supports liberal policies; 10 = strongly opposes liberal policies)	homosexuality
	for all items: (1 = strongly agree, 5 = strongly disagree)		

Table 5: Overview of the items used for the factor analysis and their exact wording in the surveys.

	Dimension 1	Dimension 2
extent of public services	0.57	
state intervention in economy	0.36	
redistribution of wealth	0.63	
immigration: assimilation		0.72
homosexuality		0.51
punishment for crime		0.63
immigration: extent		0.82
RMSEA	0.07; 95% c.i. = [0.05,0.09]	

Table 6: Confirmatory Factor Analysis

III. AUXILLIARY MATERIAL: MODEL COVARIATE ESTIMATES

NETHERLANDS 1979

Table 7: Parameter estimates: Netherlands 1979

<i>DV: Vote choice</i>	Sep.			Non-sep.		
	PvdA	D'66	CDA	PvdA	D'66	CDA
Cons.	1.02 (0.74)	-1.45 (0.19)	-0.64 (0.27)	1 (0.75)	-1.32 (0.19)	-0.6 (0.28)
Manual Labor	2.87 (0.57)	-1.47 (0.14)	-0.28 (0.19)	2.83 (0.58)	-1.34 (0.14)	-0.24 (0.19)
Religion	1.07 (0.64)	-1.37 (0.16)	-0.51 (0.22)	1.09 (0.64)	-1.29 (0.15)	-0.42 (0.22)
Income	-1.58 (0.69)	0.03 (0.05)	0.19 (0.06)	-1.27 (0.69)	0.01 (0.05)	0.17 (0.06)
Town Size	0.09 (0.35)	-0.05 (0.04)	-0.04 (0.05)	0.19 (0.37)	-0.07 (0.04)	-0.06 (0.05)
Education	-1.55 (0.6)	0.1 (0.04)	0.13 (0.05)	-1.49 (0.61)	0.09 (0.04)	0.12 (0.05)

Note: Table reports point estimates and standard errors in parenthesis.
Baseline Vote Choice: VVD

UNITED STATES PRESIDENTIAL ELECTION 2008

Table 8: Parameter estimates: United States Presidential Election 2008

<i>DV: Vote choice</i>	Sep.		Non-sep.	
	Obama	McCain	Obama	McCain
PID	0.85 (0.06)		0.85 (0.06)	
Cons.	1.71 (0.82)	0.22 (0.16)	1.45 (0.82)	0.25 (0.16)
Women	-0.2 (0.8)	0.5 (0.4)	-0.49 (0.79)	0.47 (0.4)
Age	-0.12 (0.31)	0.44 (0.4)	-0.08 (0.31)	0.41 (0.4)
Education	0.06 (0.31)	-0.02 (0.04)	0.08 (0.31)	-0.02 (0.04)
Religion	0.03 (0.01)	0.03 (0.04)	0.03 (0.01)	0.03 (0.04)
Income	0.02 (0.01)	-1.47 (0.65)	0.02 (0.01)	-1.52 (0.65)
Black	-0.13 (0.16)	0.42 (0.53)	-0.1 (0.16)	0.42 (0.53)

Note: Table reports point estimates, standard errors in parenthesis.
 Baseline Vote Choice: Independent Candidate

GERMANY 2009

Table 9: Parameter estimates: Germany 2009

<i>DV: Vote choice</i>	Sep.				Non-sep.			
	CDU	SPD	FDP	Greens	CDU	SPD	FDP	Greens
PID	3.17 (0.17)				3.15 (0.17)			
Cons.	2.04 (1.09)	-0.12 (0.12)	1.1 (0.57)	0.5 (0.49)	2.19 (1.1)	-0.09 (0.12)	1.07 (0.57)	0.53 (0.49)
Education	1.52 (1.12)	0.09 (0.12)	0.34 (0.6)	0.83 (0.5)	1.54 (1.12)	0.1 (0.12)	0.31 (0.6)	0.83 (0.49)
Class	2.12 (1.21)	0.08 (0.25)	0.98 (0.6)	-0.02 (0.01)	1.98 (1.22)	0.09 (0.25)	0.95 (0.6)	-0.03 (0.01)
Religion	-0.15 (1.25)	-0.23 (0.26)	0.15 (0.65)	-0.01 (0.01)	-0.21 (1.24)	-0.24 (0.26)	0.14 (0.65)	-0.01 (0.01)
Female	-0.03 (0.11)	0.13 (0.28)	0.83 (0.45)	-0.02 (0.01)	-0.02 (0.11)	0.18 (0.28)	0.85 (0.45)	-0.03 (0.01)
Age	-0.02 (0.11)	0.06 (0.29)	0.97 (0.46)	-0.01 (0.02)	-0.02 (0.11)	0.1 (0.29)	0.98 (0.46)	-0.01 (0.02)

Note: Table reports point estimates and standard errors in parenthesis.
Baseline Vote Choice: LEFT