

Online Appendix to: Individual characteristics associated with risk and time preferences: A multi country representative survey

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A Related Literature

A.1 Search criteria

In the first step of our literature search, we used the following criteria to search for representative studies that make use of the main established experimental elicitation methods (Harrison et al., 2008).³³

- (“representative sample”) AND (“risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”) AND (“multiple price list”)
- (“representative sample”) AND (“risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”) AND (“random lottery pair”)
- (“representative sample”) AND (“risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”) AND (“ordered lottery selection”)
- (“representative sample”) AND (“risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”) AND (“Becker Degroot Marschak”)
- (“representative sample”) AND (“risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”) AND (“Convex Time Budget”)

In the second step we broadened the search criteria considerably:

- (“large sample” OR “representative sample”) AND (“risk attitude” OR “risk preferences” OR “loss aversion” OR “time preferences” OR “present bias”)

Both steps were last updated on September 27th, 2021.

A.2 Overview of the literature

³³we excluded the Trade-Off design as the words were insufficiently discriminant, leading to too many unrelated results.

Table A.1: An overview of the literature

Articles	Sample Size ³⁴	Representative	Incentives	Risk Aversion	Loss Aversion	Time discounting	Present bias
Albert and Duffy (2012)	60		✓	✓		✓	
Almenberg and Dreber (2015)	1132	✓		✓			
Andersen et al. (2010)	343	✓	✓	✓		✓	
Andersen et al. (2018)	413	✓	✓	✓		✓	
Anderson et al. (2021)	1817			✓			
Andersson et al. (2016)	895 & 1386	✓	✓	✓			
Andersson et al. (2020)	1396	✓	✓	✓			
Aycinena et al. (2014)	184		✓	✓			
Bacon et al. (2014)	7761 [†]	✓		✓			
Bajtelsmit and Bernasek (2001)	10412			✓			
Bansback et al. (2016)	6780	✓		✓			
Bartke and Schwarze (2008)	19211	✓		✓			
Bateman et al. (2015)	1199	✓		✓	✓		
Beauchaine et al. (2017)	542					✓	
Benjamin et al. (2013)	173		✓	✓		✓	
Blake et al. (2019)	4016	✓		✓	✓		
Bonsang and Dohmen (2015)	12032			✓			
Booij et al. (2010)	814 & 438	✓		✓			
Booij and van Praag (2009)	1767			✓		✓	
Booij and van de Kuilen (2009)	1935	✓			✓		
Boschini et al. (2019)	926	✓	✓	✓			
Bouchouicha et al. (2019)	2939		✓	✓	✓		
Bouchouicha and Vieider (2019)	96175	✓		✓			
Boyle et al. (2011)	369			✓			
Brañas-Garza et al. (2018)	704		✓	✓			
Breuer et al. (2020)	711 & 327 & 962		✓	✓	✓	✓	✓
Brick et al. (2012)	2416		✓	✓			
Browne et al. (2016)	7339	✓		✓			
Browne et al. (2020)	17980	✓					
Bruderer Enzler et al. (2014)	2892 & 1407	✓				✓	
Buccioli and Miniaci (2011)	4095	✓		✓			
Burks et al. (2009)	1012		✓	✓		✓	✓
Burks et al. (2012)	958		✓			✓	✓
Burks et al. (2015)	100		✓	✓		✓	✓
Buser et al. (2020)	2565		✓	✓			
Busic-Sontic and Brick (2018)	3468			✓			
Butler et al. (2013)	1686		✓	✓			
Cardenas and Carpenter (2013)	3085	✓	✓	✓	✓		
Castillo et al. (2018)	9674	✓	✓	✓			
Chapman et al. (2018a)	1000	✓	✓	✓		✓	
Chapman et al. (2018b)	2000 & 1740	✓	✓	✓	✓	✓	
Clot et al. (2017)	186		✓	✓			
Dasgupta et al. (2016)	1872		✓	✓			
Dave et al. (2010)	881	✓	✓	✓			
Delavande et al. (2018)	843 & 780		✓	✓	✓		
Di Falco and Vieider (2018)	657		✓	✓			
Dittrich and Leipold (2014)	1019	✓				✓	

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Articles	Sample Size ³⁴	Representative	Incentives	Risk Aversion	Loss Aversion	Discounting	Present bias
Dohmen et al. (2010)	349 & 384 & 749	✓	✓	✓		✓	
Dohmen et al. (2011)	14773	✓		✓			
Donkers et al. (2001)	2593	✓		✓			
Drichoutis and Nayga (2021)	1008		✓	✓		✓	
Eckel et al. (2005)	256		✓	✓		✓	
Faff et al. (2011)	15916			✓			
Falk et al. (2018)	77445	✓		✓		✓	
Fan et al. (2020)	5500	✓		✓			
Fang et al. (2013)	2956			✓			
Fehr and Reichlin (2021)	446	✓	✓	✓			
Frederick (2005)	3428			✓			
Fredslund et al. (2018)	947					✓	✓
Freeney and O'Connell (2010)	1131					✓	
Frey et al. (2021)	916	✓	✓	✓			
Gächter et al. (2021)	326		✓		✓		
Galizzi et al. (2016)	448 & 280 [†]	✓	✓	✓			
Gärtner et al. (2017)	1365	✓		✓			
Giampietri et al. (2021)	284			✓			
Gloede et al. (2015)	1994 & 1843			✓			
Goda et al. (2019)	2317	✓	✓			✓	✓
Golsteyn et al. (2014)	11907					✓	
Görlitz and Tamm (2020)	203687			✓			
Guenther et al. (2021)	955 & 299 [†]	✓	✓	✓			
Halko et al. (2012)	328			✓			
Hansen et al. (2016)	253	✓	✓	✓		✓	
Hardeweg et al. (2013)	929		✓	✓			
Harrati (2014)	10455	✓		✓			
Harrison et al. (2002)	268	✓	✓			✓	
Harrison et al. (2007)	253	✓	✓	✓			
Hofmeyr et al. (2016)	1205		✓			✓	✓
Holden and Tilahun (2019)	1138		✓	✓			
Holm et al. (2013)	362 & 344		✓	✓			
Hopland et al. (2016)	203		✓	✓			
Horn and Kiss (2019)	932	✓		✓			
Horn and Kiss (2020a)	149					✓	
Horn and Kiss (2020b)	955					✓	
Howard and Roe (2011)	2416 & 2327 & 694			✓			
Huffman et al. (2019)	591					✓	
Hunter et al. (2018)	176		✓	✓		✓	✓
Hvide and Lee (2015)	78 & 59		✓	✓		✓	
Hwang (2017)	1698				✓		
Ioannou and Sadeh (2016)	118		✓	✓		✓	
Ionescu and Turlea (2011)	352			✓			
Jarmolowicz et al. (2012)	904					✓	
Jin et al. (2017)	200 [†]			✓			
Johnson et al. (2006)	360		✓		✓		
Jung and Treibich (2015)	3186	✓		✓			
Jung (2017)	11453	✓		✓			
Kam (2012)	2186 & 1709	✓		✓			

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Articles	Sample Size ³⁴	Representative	Incentives	Risk Aversion	Loss Aversion	Discounting	Present bias
Kettlewell (2019)	4810	✓		✓			
Khachatryan et al. (2015)	762		✓	✓			
Kim and Lee (2012)	7553	✓		✓			
Kristjanpoller and Olson (2015)	1788			✓			
Laban Peryman (2015)	552 [†]			✓		✓	
Lampi and Nordblom (2013)	2155			✓			
Le et al. (2010)	4738			✓			
Lee and Kang (2016)	1086			✓			
l'Haridon and Vieider (2019)	2939		✓	✓	✓		
Martín-Fernández et al. (2018)	1776 & 1741 & 1702 [†]	✓		✓			
Mata et al. (2016)	147118	✓		✓			
Meier and Sprenger (2015)	1684		✓			✓	✓
Melesse and Cecchi (2017)	532		✓	✓			
Menkhoff and Sakha (2017)	715 [†]		✓	✓			
Nebout et al. (2018)	1519			✓			
Newell and Siikamäki (2015)	1217	✓				✓	
Neyse et al. (2020)	3431	✓		✓			
Noussair et al. (2014)	1865	✓	✓	✓			
Oechssler et al. (2009)	564		✓	✓		✓	
Osama (2017)	8411 & 410	✓		✓			
Parouty et al. (2014)	847	✓				✓	
Pham et al. (2017)	646 [†]		✓	✓			
Picazo-Tadeo and Wall (2011)	129			✓			
Pinger et al. (2017)	310	✓	✓				✓
Pinjisakikool (2017)	4026 [†]	✓		✓			
Qiu et al. (2014)	432			✓			
Rieger et al. (2015)	5758 & 5573			✓			
Rosch (2017)	25493			✓			
Rutledge et al. (2016)	25189 [†]			✓			
Schneider and Sutter (2020)	658		✓	✓			
Schröder and Freedman (2020)	99 [†]		✓	✓			
Schurer (2015)	135807	✓		✓			
Sepahvand and Shahbazian (2017)	31677 [†]	✓		✓			
Staněk and Krčál (2018)	149		✓			✓	
Stanton et al. (2011)	298		✓	✓	✓		
Stephens and Tyran (2012)	732		✓		✓		
Sutter et al. (2013)	639		✓	✓		✓	
Tanaka et al. (2010)	181		✓	✓	✓	✓	✓
van der Heijden et al. (2011)	1102	✓	✓			✓	
Vieider et al. (2016)	200 [†]		✓	✓	✓		
Vieider et al. (2018)	493		✓	✓			
Vieider et al. (2019)	197 [†]		✓	✓	✓		
Von Gaudecker et al. (2011)	1422	✓	✓	✓	✓		
Wahl et al. (2020)	707 [†]			✓			
Wang et al. (2016)	5833					✓	✓
Wärneryd (1996)	1087			✓			
Yin (2020)	4754			✓			
Yoong et al. (2019)	2379 [†]			✓			
This study	12612	✓	✓	✓	✓	✓	✓

Table A.2: Correlations between individual characteristics and preferences reported in the literature: number of observations

Preferences	Relationship	Age	Male	Income	Education	Children	Couple	Cognitive ability
Risk aversion	Positive	673209 *	8779	20537	77274	411694	237801	0
	n.s.	208156	63534	286372	104028 *	91068 *	236240 *	18573
	Negative	63071	657783 *	240142 *	551373	6324	127674	27261 *
Loss aversion	Positive	4039	3740	4066	8150	0	3085	3740 *
	n.s.	9933	5737	2262	8317 *	4783	2897 *	1698
	Negative	11241 *	14106 *	7183 *	2699	4016 *	4016	3671
Time discounting	Positive	5171	3042 *	0	0	3324 *	3740	0
	n.s.	11556	27162	10621 *	6863	6548	7254 *	1118
	Negative	91825 *	95166	13273	16731 *	149	3321	90268 *
Present bias	Positive	1684	0 *	0	947	0	958	0
	n.s.	2509	10967	2262 *	3454 *	0 *	3740 *	3273 *
	Negative	7929 *	0	2822	0	176	176	1112

The numbers indicate the aggregated number of participants in all studies finding a specific relationship (at the 10% level for positively or negatively significant relationships).

Results from the present study are not included in the numbers reported but are indicated by *.

These results should be interpreted with caution, as a few studies using very large datasets can inflate the numbers (e.g. the world values survey database [Mata et al. \(2016\)](#)), and observations are not necessarily independent: some studies make use of the same or overlapping datasets (e.g. the German Socio-Economic Panel, SOEP), and some use longitudinal datasets, where the same respondents answer multiple times (e.g. [Schurer, 2015](#)).

B Summary Statistics

³⁴Papers that reported results for different elicitation tasks and different sub-samples were treated as separate studies. In such cases, we indicate multiple sample sizes for the same paper. Papers that reported results for different elicitation task using the same sample were treated as separate studies and were noted with [†]. For [Bouchouicha et al. \(2019\)](#), we retained the results from the most sophisticated specification (“CPT”).

Table B.1: Summary statistics of individual characteristics and controls

	FR	DE	IT	PL	RO	ES	SE	UK	Total
Age	42.23 (13.49)	42.76 (13.10)	43.01 (12.55)	38.65 (11.73)	36.50 (10.16)	41.84 (12.27)	42.57 (13.48)	41.44 (13.14)	41.21 (12.74)
Gender	0.506 (0.500)	0.520 (0.500)	0.502 (0.500)	0.526 (0.499)	0.515 (0.500)	0.512 (0.500)	0.506 (0.500)	0.506 (0.500)	0.512 (0.500)
Education	0.571 (0.495)	0.271 (0.444)	0.363 (0.481)	0.525 (0.499)	0.659 (0.474)	0.602 (0.489)	0.411 (0.492)	0.606 (0.489)	0.501 (0.500)
Income	29.71 (19.74)	36.53 (21.30)	29.04 (17.49)	14.45 (10.15)	10.38 (10.41)	27.47 (16.82)	42.33 (25.48)	47.97 (28.77)	30.11 (23.14)
Children	0.596 (0.491)	0.521 (0.500)	0.589 (0.492)	0.628 (0.483)	0.554 (0.497)	0.582 (0.493)	0.521 (0.500)	0.477 (0.499)	0.558 (0.497)
Couple	0.645 (0.479)	0.588 (0.492)	0.690 (0.463)	0.686 (0.464)	0.658 (0.474)	0.705 (0.456)	0.503 (0.500)	0.587 (0.492)	0.634 (0.482)
Urban	0.481 (0.500)	0.504 (0.500)	0.645 (0.478)	0.612 (0.487)	0.671 (0.470)	0.630 (0.483)	0.571 (0.495)	0.653 (0.476)	0.595 (0.491)
CRT	0.881 (1.013)	1.068 (1.055)	0.608 (0.776)	0.785 (1.024)	0.668 (0.934)	0.779 (0.994)	0.992 (1.060)	0.949 (1.053)	0.844 (1.004)
Achievement	0.230 (0.421)	0.425 (0.494)	0.509 (0.500)	0.456 (0.498)	0.712 (0.453)	0.462 (0.499)	0.290 (0.454)	0.362 (0.481)	0.427 (0.495)
Benevolence	0.516 (0.500)	0.882 (0.323)	0.859 (0.348)	0.608 (0.488)	0.820 (0.384)	0.771 (0.420)	0.650 (0.477)	0.654 (0.476)	0.719 (0.449)
Conformity	0.707 (0.455)	0.621 (0.485)	0.744 (0.436)	0.578 (0.494)	0.757 (0.429)	0.642 (0.479)	0.524 (0.499)	0.640 (0.480)	0.653 (0.476)
Hedonism	0.512 (0.500)	0.814 (0.389)	0.725 (0.447)	0.295 (0.456)	0.613 (0.487)	0.626 (0.484)	0.528 (0.499)	0.420 (0.494)	0.567 (0.496)
Power	0.156 (0.362)	0.322 (0.467)	0.406 (0.491)	0.327 (0.469)	0.324 (0.468)	0.287 (0.452)	0.240 (0.427)	0.262 (0.440)	0.290 (0.454)
Security	0.507 (0.500)	0.766 (0.423)	0.830 (0.376)	0.750 (0.433)	0.806 (0.395)	0.745 (0.436)	0.698 (0.459)	0.736 (0.441)	0.728 (0.445)
Self direction	0.509 (0.500)	0.696 (0.460)	0.805 (0.396)	0.691 (0.462)	0.800 (0.400)	0.688 (0.463)	0.576 (0.494)	0.608 (0.488)	0.670 (0.470)
Stimulation	0.245 (0.430)	0.382 (0.486)	0.449 (0.497)	0.417 (0.493)	0.462 (0.499)	0.359 (0.480)	0.345 (0.475)	0.366 (0.482)	0.376 (0.484)
Tradition	0.472 (0.499)	0.569 (0.495)	0.709 (0.454)	0.594 (0.491)	0.656 (0.475)	0.510 (0.500)	0.455 (0.498)	0.518 (0.500)	0.560 (0.496)
Universalism	0.648 (0.478)	0.720 (0.449)	0.826 (0.379)	0.598 (0.490)	0.759 (0.428)	0.715 (0.452)	0.584 (0.493)	0.591 (0.492)	0.680 (0.466)
ABreversed	0.498 (0.500)	0.496 (0.500)	0.502 (0.500)	0.496 (0.500)	0.508 (0.500)	0.493 (0.500)	0.500 (0.500)	0.510 (0.500)	0.500 (0.500)
Incentivized	0.607 (0.488)	0.446 (0.497)	0.456 (0.498)	0.610 (0.488)	0.720 (0.449)	0.596 (0.491)	0.601 (0.490)	0.448 (0.497)	0.555 (0.497)
LowStakes	0.0988 (0.298)	0.0499 (0.218)	0.0537 (0.225)	0.102 (0.302)	0.0663 (0.249)	0.102 (0.303)	0.0674 (0.251)	0.0484 (0.215)	0.0734 (0.261)
HighStakes	0.124 (0.329)	0.0926 (0.290)	0.0889 (0.285)	0.122 (0.327)	0.0852 (0.279)	0.132 (0.339)	0.101 (0.301)	0.0917 (0.289)	0.105 (0.306)

Standard deviation in parentheses

C Country-level estimates

Table C.1: All countries

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002** (0.001)	-0.002** (0.001)	-0.003*** (0.000)	-0.000 (0.000)	0.001 (0.000)	-0.007*** (0.001)
Male	-0.027 (0.014)	-0.356*** (0.016)	0.026** (0.009)	0.004* (0.002)	-0.005 (0.007)	0.102** (0.032)
Education	0.005 (0.015)	-0.007 (0.013)	-0.022* (0.009)	-0.001 (0.002)	-0.024*** (0.007)	0.006 (0.032)
Income	-0.003*** (0.000)	0.000 (0.000)	-0.001*** (0.000)	-0.000 (0.000)	-0.000** (0.000)	0.002*** (0.001)
Children	-0.007 (0.017)	-0.030* (0.014)	0.042*** (0.010)	-0.003 (0.002)	0.020* (0.008)	0.053 (0.034)
Couple	-0.002 (0.017)	-0.006 (0.015)	0.023* (0.010)	0.000 (0.002)	0.002 (0.008)	0.043 (0.034)
Urban	-0.017 (0.014)	-0.012 (0.012)	0.021* (0.009)	0.004* (0.002)	0.023*** (0.007)	0.037 (0.029)
CRT	-0.020** (0.007)	0.006 (0.006)	-0.033*** (0.004)	-0.001 (0.001)	-0.067*** (0.003)	-0.002 (0.013)
Constant	0.526*** (0.030)	2.067*** (0.033)	0.398*** (0.019)	0.012*** (0.004)	0.470*** (0.014)	0.777*** (0.063)
N	443415					
Log. Likelihood	-256038					
BIC	512777					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.2: France

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.004** (0.001)	0.000 (0.001)	0.000 (0.001)	-0.000* (0.000)	0.001 (0.001)	-0.007* (0.003)
Male	-0.041 (0.034)	-0.051* (0.022)	0.041* (0.018)	0.000 (0.003)	-0.027 (0.015)	0.154 (0.082)
Education	0.036 (0.039)	0.009 (0.022)	-0.045* (0.020)	0.000 (0.004)	-0.039* (0.016)	-0.085 (0.091)
Income	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.000)	-0.000 (0.000)	-0.001 (0.000)	0.002 (0.002)
Children	-0.028 (0.037)	-0.037 (0.027)	0.021 (0.021)	-0.002 (0.004)	-0.013 (0.018)	-0.013 (0.075)
Couple	-0.034 (0.037)	0.011 (0.024)	-0.017 (0.020)	-0.001 (0.004)	-0.001 (0.018)	0.074 (0.084)
Urban	-0.015 (0.034)	0.014 (0.021)	-0.007 (0.018)	0.002 (0.003)	0.017 (0.015)	-0.016 (0.077)
CRT	-0.011 (0.015)	0.009 (0.010)	-0.020* (0.008)	-0.000 (0.002)	-0.042*** (0.007)	0.008 (0.037)
Constant	0.337*** (0.073)	2.007*** (0.042)	0.241*** (0.040)	0.025*** (0.007)	0.439*** (0.030)	0.798*** (0.175)
N	59325					
Log. Likelihood	-32677					
BIC	65948					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.3: Germany

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002 (0.002)	-0.002* (0.001)	-0.003*** (0.001)	-0.000 (0.000)	0.000 (0.001)	-0.007** (0.002)
Male	-0.043 (0.039)	-0.020 (0.023)	0.027 (0.019)	0.006 (0.004)	-0.009 (0.018)	0.061 (0.063)
Education	-0.017 (0.040)	0.002 (0.024)	-0.044* (0.018)	0.004 (0.004)	-0.039* (0.019)	0.062 (0.085)
Income	-0.002* (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.002 (0.002)
Children	-0.070 (0.040)	0.003 (0.024)	0.040* (0.019)	-0.005 (0.004)	0.052** (0.019)	0.139* (0.071)
Couple	-0.067 (0.045)	-0.387*** (0.031)	0.040 (0.022)	0.003 (0.005)	0.006 (0.020)	0.124 (0.078)
Urban	0.025 (0.034)	-0.001 (0.021)	-0.015 (0.018)	0.006 (0.004)	0.007 (0.017)	-0.019 (0.062)
CRT	-0.032 (0.020)	0.007 (0.010)	-0.035*** (0.008)	-0.003 (0.002)	-0.077*** (0.008)	0.020 (0.030)
Constant	0.581*** (0.082)	2.056*** (0.057)	0.356*** (0.045)	0.007 (0.009)	0.496*** (0.040)	0.630*** (0.136)
N	59115					
Log. Likelihood	-34058					
BIC	68708					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.4: Italy

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002 (0.002)	-0.005 (0.004)	-0.002 (0.001)	-0.000 (0.000)	-0.001 (0.001)	-0.009 (0.005)
Male	0.029 (0.039)	-0.041 (0.071)	-0.049 (0.027)	0.011* (0.006)	0.024 (0.018)	-0.128 (0.123)
Education	-0.017 (0.039)	0.037 (0.064)	-0.062* (0.027)	0.004 (0.006)	-0.008 (0.019)	-0.035 (0.134)
Income	-0.002 (0.001)	-0.006*** (0.001)	-0.001 (0.001)	-0.000 (0.000)	-0.001 (0.001)	0.003 (0.004)
Children	0.033 (0.045)	-0.030 (0.079)	-0.004 (0.033)	-0.011 (0.008)	0.011 (0.024)	-0.064 (0.141)
Couple	-0.041 (0.049)	0.016 (0.079)	0.039 (0.036)	0.003 (0.008)	0.008 (0.024)	0.085 (0.149)
Urban	-0.042 (0.041)	-0.027 (0.075)	0.011 (0.028)	0.009 (0.006)	0.024 (0.018)	0.075 (0.130)
CRT	0.005 (0.019)	0.027 (0.034)	-0.031* (0.013)	-0.004 (0.003)	-0.074*** (0.011)	-0.042 (0.052)
Constant	0.372*** (0.090)	2.301*** (0.153)	0.492*** (0.064)	0.042** (0.014)	0.474*** (0.039)	1.254*** (0.283)
N	56735					
Log. Likelihood	-32434					
BIC	65460					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.5: Poland

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	-0.000 (0.002)	-0.015** (0.005)	0.001 (0.002)	0.000 (0.000)	0.002 (0.001)	-0.000 (0.004)
Male	-0.054 (0.038)	-0.218 (0.126)	0.038 (0.044)	-0.008 (0.006)	0.043 (0.024)	0.068 (0.081)
Education	-0.041 (0.051)	-0.156 (0.110)	-0.067 (0.054)	0.007 (0.006)	-0.006 (0.026)	-0.041 (0.116)
Income	0.001 (0.003)	-0.005 (0.006)	-0.001 (0.003)	0.000 (0.000)	-0.001 (0.003)	0.001 (0.002)
Children	0.074 (0.044)	0.104 (0.117)	-0.051 (0.045)	0.003 (0.008)	-0.016 (0.031)	-0.069 (0.086)
Couple	-0.017 (0.044)	0.068 (0.120)	0.011 (0.044)	-0.008 (0.007)	-0.035 (0.028)	0.040 (0.097)
Urban	-0.009 (0.041)	0.048 (0.092)	0.028 (0.039)	0.001 (0.005)	0.046 (0.024)	-0.043 (0.088)
CRT	-0.047* (0.020)	0.025 (0.046)	-0.042* (0.018)	0.002 (0.002)	-0.050*** (0.011)	-0.019 (0.036)
Constant	0.733*** (0.077)	2.485*** (0.171)	0.340*** (0.102)	0.008 (0.013)	0.306*** (0.050)	0.625*** (0.184)
N	55195					
Log. Likelihood	-31290					
BIC	63170					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.6: Romania

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.004 (0.004)	-0.001 (0.006)	0.001 (0.007)	-0.001 (0.001)	0.002 (0.002)	0.000 (0.011)
Male	-0.021 (0.112)	-0.123 (0.103)	0.059 (0.186)	0.009 (0.015)	0.002 (0.037)	0.084 (0.329)
Education	-0.089 (0.113)	-0.011 (0.116)	-0.006 (0.138)	-0.004 (0.012)	0.032 (0.041)	0.066 (0.275)
Income	0.001 (0.006)	0.000 (0.005)	0.000 (0.004)	-0.000 (0.000)	-0.004* (0.002)	0.003 (0.015)
Children	-0.109 (0.114)	-0.097 (0.146)	0.151 (0.166)	-0.019 (0.017)	0.012 (0.047)	0.275 (0.335)
Couple	-0.033 (0.102)	-0.067 (0.170)	0.039 (0.092)	-0.001 (0.013)	0.009 (0.044)	0.084 (0.209)
Urban	-0.000 (0.084)	-0.092 (0.117)	-0.016 (0.112)	-0.018 (0.012)	0.038 (0.042)	-0.112 (0.274)
CRT	0.004 (0.035)	0.081 (0.048)	-0.086* (0.043)	0.009* (0.004)	-0.080*** (0.016)	-0.111 (0.079)
Constant	0.528*** (0.153)	1.833*** (0.238)	0.432* (0.187)	0.029 (0.023)	0.392*** (0.080)	0.752* (0.346)
N	48300					
Log. Likelihood	-29033					
BIC	58649					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.7: Spain

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002 (0.002)	-0.007 (0.007)	-0.001 (0.001)	-0.000 (0.000)	0.000 (0.001)	-0.007 (0.005)
Male	-0.053 (0.043)	-0.060 (0.089)	0.051 (0.029)	0.009 (0.006)	-0.001 (0.019)	0.263* (0.129)
Education	-0.032 (0.044)	0.049 (0.173)	0.006 (0.033)	-0.003 (0.006)	-0.054* (0.025)	0.205 (0.154)
Income	-0.001 (0.001)	-0.004 (0.002)	-0.001 (0.001)	0.000 (0.000)	-0.001 (0.001)	-0.002 (0.004)
Children	-0.025 (0.045)	-0.061 (0.186)	0.036 (0.038)	0.008 (0.007)	0.040 (0.025)	0.121 (0.128)
Couple	0.040 (0.048)	-0.003 (0.232)	0.004 (0.033)	0.003 (0.006)	0.004 (0.023)	-0.022 (0.129)
Urban	-0.073 (0.041)	0.079 (0.178)	0.059 (0.031)	0.005 (0.006)	0.026 (0.020)	0.182 (0.113)
CRT	-0.009 (0.018)	-0.011 (0.045)	-0.034** (0.011)	-0.002 (0.002)	-0.095*** (0.009)	0.006 (0.041)
Constant	0.441*** (0.099)	2.069*** (0.481)	0.323*** (0.062)	0.006 (0.012)	0.517*** (0.048)	0.778* (0.305)
N	56385					
Log. Likelihood	-32948					
BIC	66487					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.8: Sweden

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.001 (0.002)	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.000)	-0.001 (0.001)	-0.007 (0.005)
Male	-0.052 (0.037)	-0.037 (0.031)	0.051* (0.021)	-0.005 (0.004)	-0.003 (0.018)	0.170 (0.132)
Education	0.070 (0.038)	-0.015 (0.028)	-0.062** (0.022)	-0.006 (0.004)	-0.006 (0.018)	-0.285* (0.132)
Income	-0.000 (0.001)	-0.001 (0.001)	-0.000 (0.001)	0.000 (0.000)	-0.001** (0.000)	0.001 (0.003)
Children	-0.020 (0.053)	-0.038 (0.032)	0.041 (0.027)	-0.012* (0.005)	0.046* (0.022)	0.046 (0.148)
Couple	-0.012 (0.047)	0.036 (0.036)	0.009 (0.026)	0.000 (0.005)	0.026 (0.021)	0.067 (0.162)
Urban	-0.005 (0.038)	-0.023 (0.028)	0.020 (0.022)	-0.001 (0.004)	0.052** (0.018)	0.006 (0.125)
CRT	-0.030 (0.019)	0.009 (0.013)	-0.025** (0.009)	0.002 (0.002)	-0.068*** (0.009)	0.065 (0.063)
Constant	0.354*** (0.079)	2.108*** (0.079)	0.313*** (0.044)	0.005 (0.009)	0.505*** (0.039)	1.060*** (0.262)
N	46025					
Log. Likelihood	-25898					
BIC	52377					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table C.9: United Kingdom

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.005*** (0.001)	-0.002 (0.002)	-0.005*** (0.001)	-0.000 (0.000)	0.000 (0.001)	-0.009*** (0.002)
Male	-0.034 (0.034)	-0.095* (0.045)	-0.009 (0.019)	0.006 (0.003)	-0.012 (0.016)	0.030 (0.053)
Education	-0.031 (0.039)	0.040 (0.037)	-0.004 (0.021)	0.006 (0.004)	0.007 (0.017)	0.047 (0.066)
Income	-0.001* (0.001)	-0.001 (0.001)	-0.001 (0.000)	-0.000* (0.000)	-0.000 (0.000)	0.001 (0.001)
Children	-0.039 (0.043)	-0.017 (0.035)	0.056** (0.020)	0.004 (0.004)	0.047* (0.020)	0.019 (0.063)
Couple	-0.018 (0.045)	0.019 (0.037)	0.008 (0.023)	0.002 (0.004)	0.001 (0.020)	-0.001 (0.067)
Urban	-0.058 (0.036)	-0.066 (0.041)	0.020 (0.020)	0.004 (0.004)	0.027 (0.016)	0.088 (0.057)
CRT	-0.023 (0.016)	0.015 (0.016)	-0.014 (0.009)	-0.001 (0.002)	-0.059*** (0.007)	0.027 (0.026)
Constant	0.497*** (0.074)	2.136*** (0.098)	0.428*** (0.052)	0.016 (0.009)	0.422*** (0.034)	0.753*** (0.151)
N	62335					
Log. Likelihood	-34942					
BIC	70480					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D Robustness checks

D.1 Excluding multiple switchers

In our main specification, employing maximum likelihood methods to estimate the preference parameters allows us to retain multiple switchers. However, multiple switch points may also signal participant confusion with the experiment or lack of focus. Excluding multiple switchers leads to a reduction of the sample by 2.079 respondents. Table D.1 contains estimates of the main specification for this reduced sample. Qualitatively, the results for the relation between individual characteristics and preference parameters are similar to those reported in Table 8. For the smaller sample, however, *Power* and *Tradition* are now positively correlated with risk aversion; *FR* is now correlated negatively with risk aversion; *RO* is correlated negatively with loss aversion; *ES* is now correlated positively with present bias. *LowStakes* is no longer significantly related to risk aversion; loss aversion is no longer significantly related to *CRT*; *Stimulation* is not longer related to time discounting; and *Male*, *Urban*, *Conformity* and *RO* are no longer related to present bias. In sum, for the statistically significant coefficients in our main specification, we find no statistically significant coefficient with the opposite sign in Table D.1, and vice versa. Therefore, our main findings appear robust to excluding multiple switchers.

D.2 Alternative utility specifications

The specification of utility can have a strong impact on the estimated preference parameters and on their correlations with individual characteristics. In this section, we therefore vary several assumptions underlying our modelling of preferences. In particular, there is a vivid discussion in the literature on how to correctly account for structural connections of different preference domains. For instance, the standard time-separable discounted expected utility model assumes that utility over risk and time are connected because risk aversion and the elasticity of intertemporal substitution are governed by the same parameter. In this context, Andersen et al. (2008) argue that a failure to account for utility curvature when eliciting discount rates may bias the resulting estimates. Several studies have subsequently suggested that the curvature of utility over risk is different from the curvature of utility over time (Andreoni and Sprenger, 2012; Abdellaoui et al., 2013).³⁵ In these cases, risk and time preferences should better be estimated separably. The theoretical framework underlying the main specification of our paper is built on a discounted expected utility model that assumes utility over risk and time to be connected.

³⁵But, see also Meissner and Pfeiffer (2022), who find similar estimates for curvature of utility over risk and time.

Table D.1: Robustness check: no multiple switchers

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	-0.005*** (0.001)	-0.001** (0.000)	-0.000* (0.000)	0.001*** (0.000)	-0.004*** (0.001)
Male	-0.039** (0.013)	-0.132*** (0.031)	0.021** (0.008)	0.003 (0.002)	-0.014* (0.006)	0.071** (0.028)
Education	-0.023 (0.014)	0.007 (0.032)	-0.026** (0.009)	0.000 (0.002)	-0.026*** (0.007)	0.029 (0.030)
Income	-0.001** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	0.001 (0.001)
Children	-0.009 (0.015)	-0.065 (0.037)	0.028** (0.009)	-0.001 (0.002)	-0.002 (0.008)	0.042 (0.031)
Couple	-0.012 (0.015)	0.024 (0.036)	-0.001 (0.009)	-0.000 (0.002)	-0.010 (0.008)	0.021 (0.031)
Urban	-0.012 (0.012)	0.004 (0.030)	0.004 (0.008)	0.003 (0.002)	0.005 (0.006)	0.033 (0.026)
CRT	-0.027*** (0.006)	0.013 (0.014)	-0.023*** (0.004)	-0.001 (0.001)	-0.040*** (0.003)	0.010 (0.013)
Achievement	-0.012 (0.016)	0.023 (0.034)	0.010 (0.010)	-0.002 (0.002)	0.001 (0.008)	0.023 (0.037)
Benevolence	-0.006 (0.015)	0.032 (0.040)	0.002 (0.010)	0.001 (0.002)	0.004 (0.008)	-0.010 (0.032)
Conformity	0.003 (0.014)	0.021 (0.033)	-0.005 (0.009)	-0.003 (0.002)	0.010 (0.007)	-0.002 (0.031)
Hedonism	-0.026 (0.016)	-0.029 (0.034)	0.032*** (0.009)	0.002 (0.002)	-0.015* (0.007)	0.088* (0.035)
Power	0.035* (0.017)	0.034 (0.039)	-0.012 (0.011)	0.000 (0.002)	0.019* (0.008)	-0.071 (0.039)
Security	0.002 (0.015)	0.024 (0.035)	-0.006 (0.010)	-0.000 (0.002)	0.003 (0.007)	-0.010 (0.036)
Self direction	0.006 (0.015)	-0.019 (0.036)	0.003 (0.009)	-0.002 (0.002)	-0.022** (0.007)	-0.015 (0.032)
Stimulation	-0.045** (0.016)	-0.113*** (0.033)	0.019 (0.011)	-0.001 (0.002)	0.022** (0.007)	0.113** (0.040)
Tradition	0.031* (0.013)	-0.035 (0.031)	-0.001 (0.009)	0.001 (0.002)	0.006 (0.007)	-0.062* (0.031)
Universalism	-0.012 (0.015)	-0.053 (0.037)	-0.013 (0.010)	-0.003 (0.002)	-0.013 (0.008)	-0.004 (0.033)
FR	-0.056* (0.028)	0.233*** (0.068)	0.017 (0.015)	0.006* (0.003)	-0.038** (0.013)	0.067 (0.055)
IT	-0.093** (0.029)	0.162** (0.061)	0.083*** (0.016)	0.013*** (0.003)	-0.070*** (0.013)	0.207** (0.064)
PL	0.173*** (0.031)	0.052 (0.073)	0.067** (0.022)	0.004 (0.004)	-0.117*** (0.016)	-0.061 (0.051)
RO	0.096* (0.044)	-0.143* (0.070)	0.228*** (0.044)	-0.008 (0.005)	-0.025 (0.019)	0.090 (0.094)
ES	-0.040 (0.029)	-0.042 (0.055)	0.071*** (0.017)	0.008* (0.003)	-0.021 (0.013)	0.164* (0.065)
SE	-0.120*** (0.028)	0.247*** (0.057)	0.019 (0.014)	0.003 (0.003)	-0.036** (0.013)	0.226** (0.071)
UK	0.030 (0.028)	0.245*** (0.067)	0.030* (0.015)	0.003 (0.003)	-0.037** (0.012)	-0.042 (0.051)
ABreversed	0.034** (0.012)	0.021 (0.030)	-0.020* (0.008)	-0.005** (0.002)	0.010 (0.006)	-0.075** (0.027)
Incentivized	-0.049** (0.015)	-0.176*** (0.038)	0.061*** (0.009)	-0.019*** (0.002)	-0.010 (0.007)	0.076* (0.034)
LowStakes	-0.025 (0.024)	-0.124* (0.050)	-0.011 (0.017)	0.026*** (0.004)	0.006 (0.012)	0.054 (0.063)
HighStakes	0.025 (0.025)	0.218* (0.085)	-0.032* (0.013)	-0.009** (0.003)	0.028* (0.011)	-0.018 (0.047)
Constant	0.541*** (0.043)	2.211*** (0.106)	0.248*** (0.023)	0.028*** (0.005)	0.392*** (0.021)	0.613*** (0.079)
N	369985					
Log. Likelihood	-200483					
BIC	403274					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Further, our findings may change if our underlying model allows for probability weighting. If individuals weigh probabilities non linearly, failure to account for probability weighting can bias estimates of risk aversion and other preference parameters (Bouchouicha and Vieider, 2019; Abdellaoui et al., 2019). Our setup does not allow to identify probability weighting, because we do not vary the probabilities in our MPLs. For practical reasons, all lotteries in our experiments were 50/50 gambles, conveyed in everyday language as coin flips. As stressed by Andersen et al. (2018), assessing probability weighting significantly increases task complexity in MPLs. Naturally, our demographically representative sample included many participants with lower levels of education. Therefore, we decided to reduce task complexity and to abstract from probability weighting.

Below, we first test robustness of our findings with respect to the specified utility function $u(x)$. We then present specifications that estimate time preference separately from risk preferences, and a specification that assumes no present bias.

Different utility curvature in gains and losses: First, our main model assumes the same curvature of utility in gains and losses (around the reference point of zero). As an alternative, we allow for different curvature in gains and losses, at the cost of restricting the parameter for loss aversion ($\lambda = 1$). We therefore assume the following utility function:

$$u(x) = \begin{cases} \frac{x^{1-\alpha^+}}{1-\alpha^+} & \text{if } x \geq 0 \\ \frac{-(-x)^{1-\alpha^-}}{1-\alpha^-} & \text{if } x < 0, \end{cases} \quad (\text{D.5})$$

where α^+ and α^- denote curvature of utility in gains and losses, respectively. We present the estimation results of this model in Table D.2. All correlations of individual characteristics with preference parameters other than the new parameter α^- remain almost identical. Many of the individual characteristics that are related to curvature in gains are related in a similar way to curvature in losses. For instance, *Age*, *PL*, *RO*, and *ABreversed* are positively correlated with curvature in both gains and losses. *CRT*, *Stimulation*, *IT*, and *SE* are negatively correlated with curvature in both gains and losses. *Male*, *Income*, *Incentivization*, and *LowStakes* are negatively related to curvature in gains, but not related to curvature in losses. In comparison, *Tradition* (*FR*) is positively (negatively) related to curvature in losses, but is not related to curvature in gains.

CARA utility: Our main specification assumes that preferences are characterized by constant relative risk aversion (CRRA). To examine whether our results are robust to that assumption, we estimate an alternative specification, which assumes constant absolute risk aversion (CARA) in Table D.3:

Table D.2: Robustness check: different utility curvature in gains and losses

	Gains $\alpha+$	Losses $\alpha-$	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	0.003*** (0.001)	-0.001** (0.000)	-0.000* (0.000)	0.001* (0.000)	-0.004*** (0.001)
Male	-0.037** (0.012)	-0.013 (0.012)	0.019* (0.008)	0.003* (0.002)	-0.003 (0.007)	0.076** (0.028)
Education	-0.018 (0.014)	-0.020 (0.013)	-0.032*** (0.009)	0.001 (0.002)	-0.021** (0.007)	0.019 (0.032)
Income	-0.001** (0.000)	-0.001 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.001*** (0.000)	0.002* (0.001)
Children	-0.014 (0.014)	-0.004 (0.014)	0.031*** (0.009)	-0.002 (0.002)	0.025** (0.008)	0.030 (0.031)
Couple	-0.013 (0.015)	-0.015 (0.014)	-0.000 (0.009)	0.001 (0.002)	0.002 (0.008)	0.020 (0.031)
Urban	-0.021 (0.012)	-0.020 (0.012)	0.008 (0.008)	0.003* (0.002)	0.020** (0.007)	0.036 (0.028)
CRT	-0.021*** (0.006)	-0.025*** (0.006)	-0.027*** (0.004)	-0.001 (0.001)	-0.064*** (0.003)	0.005 (0.013)
Achievement	-0.012 (0.016)	-0.013 (0.016)	0.008 (0.010)	-0.000 (0.002)	0.010 (0.008)	0.010 (0.041)
Benevolence	0.001 (0.015)	-0.005 (0.014)	-0.001 (0.010)	0.002 (0.002)	-0.006 (0.008)	-0.014 (0.034)
Conformity	0.002 (0.014)	-0.002 (0.013)	-0.004 (0.009)	-0.004* (0.002)	0.012 (0.007)	-0.008 (0.032)
Hedonism	-0.023 (0.015)	-0.016 (0.015)	0.032*** (0.009)	0.002 (0.002)	-0.021** (0.007)	0.103** (0.036)
Power	0.031 (0.017)	0.027 (0.017)	-0.005 (0.011)	0.000 (0.002)	0.054*** (0.009)	-0.075 (0.042)
Security	-0.002 (0.015)	-0.006 (0.015)	-0.005 (0.010)	-0.000 (0.002)	-0.015 (0.008)	-0.008 (0.036)
Self direction	-0.001 (0.014)	0.005 (0.014)	0.005 (0.009)	-0.002 (0.002)	-0.031*** (0.008)	-0.012 (0.033)
Stimulation	-0.056*** (0.016)	-0.034* (0.016)	0.023* (0.011)	-0.001 (0.002)	0.041*** (0.008)	0.122** (0.044)
Tradition	0.021 (0.013)	0.026* (0.013)	0.002 (0.009)	0.000 (0.002)	0.017* (0.007)	-0.046 (0.032)
Universalism	-0.013 (0.014)	-0.005 (0.014)	-0.011 (0.010)	-0.004 (0.002)	-0.012 (0.008)	0.007 (0.034)
FR	-0.045 (0.027)	-0.086** (0.027)	0.017 (0.014)	0.006* (0.003)	-0.076*** (0.013)	0.102 (0.056)
IT	-0.075** (0.028)	-0.104*** (0.028)	0.083*** (0.016)	0.016*** (0.003)	-0.066*** (0.013)	0.231*** (0.067)
PL	0.200*** (0.029)	0.191*** (0.029)	0.067** (0.022)	0.004 (0.004)	-0.139*** (0.017)	-0.033 (0.052)
RO	0.103* (0.042)	0.117** (0.041)	0.246*** (0.043)	-0.018*** (0.005)	-0.035 (0.019)	0.195 (0.105)
ES	-0.033 (0.028)	-0.032 (0.029)	0.075*** (0.018)	0.007 (0.004)	-0.019 (0.013)	0.206** (0.069)
SE	-0.109*** (0.027)	-0.149*** (0.027)	0.019 (0.014)	0.003 (0.003)	-0.037** (0.013)	0.255*** (0.073)
UK	0.045 (0.027)	0.003 (0.027)	0.031* (0.015)	0.003 (0.003)	-0.052*** (0.013)	-0.029 (0.051)
ABreversed	0.039** (0.012)	0.033** (0.012)	-0.019* (0.008)	-0.007*** (0.002)	0.022*** (0.006)	-0.099*** (0.028)
Incentivized	-0.045** (0.015)	-0.014 (0.015)	0.064*** (0.009)	-0.022*** (0.002)	-0.011 (0.007)	0.081* (0.035)
LowStakes	-0.048* (0.023)	-0.021 (0.024)	-0.011 (0.017)	0.028*** (0.004)	0.017 (0.013)	0.095 (0.068)
HighStakes	0.025 (0.025)	0.005 (0.023)	-0.036** (0.013)	-0.007** (0.003)	0.030* (0.012)	-0.011 (0.048)
Constant	0.528*** (0.042)	0.305*** (0.041)	0.254*** (0.023)	0.030*** (0.005)	0.484*** (0.022)	0.615*** (0.082)
N	443415					
Log. Likelihood	-252970					
BIC	508280					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

$$u(x) = \begin{cases} \frac{1 - \exp(-\varphi x)}{\varphi} & \text{if } x \geq 0 \\ \frac{-\lambda(1 - \exp(\varphi x))}{\varphi} & \text{if } x < 0 \end{cases} \quad (\text{D.6})$$

Here, φ is the parameter of absolute risk aversion. The results are largely robust, with a few exceptions. *Age* and *Male* are no longer correlated with present bias. Similarly, the correlation between *Male*, *Stimulation* and *ABreversed* with discounting are no longer statistically significant. On the other hand, a few relations are statistically significant under this specification but not for our main specification. Risk aversion is now negatively related to living as a couple, and positively related to *Achievement* and *Tradition*. Finally, discounting is now negatively associated with *Income*.

ε -normalization: While in our main specification the estimate of relative risk aversion is below unity, our multiple price lists allow levels of relative risk aversion above unity (i.e. $\alpha > 1$). For such high levels of relative risk aversion, it may be difficult to estimate loss aversion, because the derivatives of the utility function diverge around the reference point (see [Wakker \(2008\)](#) for an illustration). To explore the sensitivity of our findings regarding this issue, we use the following transformation to normalize the utility function:

$$u(x) = \begin{cases} \frac{(x+\varepsilon)^{1-\alpha} - \varepsilon^{1-\alpha}}{1-\alpha} & \text{if } x \geq 0 \\ \frac{-\lambda((-x+\varepsilon)^{1-\alpha} - \varepsilon^{1-\alpha})}{1-\alpha} & \text{if } x < 0 \end{cases} \quad (\text{D.7})$$

This transformation ensures that utility is well behaved for gains and losses for values of $\alpha > 1$, while closely approximating CRRA utility for small values of ε (we set $\varepsilon = 0.001$). In particular, this transformation ensures that $u(0) = 0$ for all values of α , and thus that the derivatives of the utility function around the reference point do not diverge (see also [Vendrik and Woltjer \(2007\)](#) or [Schleich et al. \(2019\)](#) for similar applications). Results for this model appear in Table D.4. They are virtually identical to those obtained from our main specification.

No present bias: Further, we estimate a model that abstracts from present bias, and instead includes a single constant discount rate (i.e., assuming exponential discounting). Thus, the intertemporal utility specification corresponds to Equation 2, with the restriction $\gamma = 0$. We present the findings of this model in Table D.5. The results for all individual characteristics are virtually identical to those found for our main specification. As discount rates may differ across our two time horizons, we also estimate a model that allows the discount rates to vary across the time horizons (Table D.6). Because the dates are equally far apart, the two discount rates should be equivalent under exponential discounting. Our data, however, does not support this hypothesis. Instead, we find that

Table D.3: Robustness check: CARA utility

	Risk aversion φ	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.0001*** (0.0000)	-0.0056*** (0.0009)	-0.0011** (0.0004)	-0.0002 (0.0001)	0.0006 (0.0003)	-0.0058** (0.0022)
Male	-0.0010** (0.0003)	-0.0902*** (0.0208)	0.0154 (0.0083)	0.0034 (0.0019)	-0.0011 (0.0070)	0.0379 (0.0506)
Education	-0.0005 (0.0003)	0.0060 (0.0220)	-0.0406*** (0.0090)	0.0004 (0.0020)	-0.0212** (0.0072)	0.0049 (0.0548)
Income	-0.0000* (0.0000)	-0.0011* (0.0005)	-0.0004* (0.0002)	-0.0000 (0.0000)	-0.0007*** (0.0002)	0.0002 (0.0012)
Children	-0.0005 (0.0004)	-0.0423 (0.0257)	0.0358*** (0.0099)	-0.0032 (0.0022)	0.0294*** (0.0083)	-0.0060 (0.0606)
Couple	-0.0008* (0.0004)	0.0245 (0.0255)	-0.0007 (0.0099)	0.0016 (0.0022)	0.0050 (0.0081)	0.0368 (0.0590)
Urban	-0.0006 (0.0003)	0.0027 (0.0205)	0.0047 (0.0085)	0.0039* (0.0019)	0.0229*** (0.0069)	-0.0003 (0.0496)
CRT	-0.0004** (0.0002)	0.0297** (0.0098)	-0.0358*** (0.0037)	-0.0009 (0.0009)	-0.0668*** (0.0033)	-0.0433 (0.0244)
Achievement	-0.0008* (0.0004)	0.0185 (0.0236)	0.0091 (0.0103)	-0.0001 (0.0023)	0.0134 (0.0080)	-0.0012 (0.0615)
Benevolence	-0.0000 (0.0004)	0.0253 (0.0275)	-0.0013 (0.0101)	0.0026 (0.0023)	-0.0063 (0.0085)	-0.0329 (0.0615)
Conformity	0.0002 (0.0003)	0.0106 (0.0228)	-0.0041 (0.0091)	-0.0044* (0.0021)	0.0095 (0.0076)	0.0209 (0.0547)
Hedonism	-0.0003 (0.0004)	-0.0233 (0.0233)	0.0294** (0.0092)	0.0016 (0.0021)	-0.0225** (0.0078)	0.1939*** (0.0561)
Power	0.0004 (0.0004)	0.0213 (0.0261)	0.0064 (0.0115)	0.0007 (0.0026)	0.0541*** (0.0089)	-0.0245 (0.0696)
Security	-0.0001 (0.0004)	0.0203 (0.0247)	-0.0044 (0.0097)	-0.0002 (0.0022)	-0.0175* (0.0082)	0.0127 (0.0587)
Self direction	0.0003 (0.0004)	-0.0244 (0.0241)	0.0045 (0.0093)	-0.0031 (0.0021)	-0.0344*** (0.0079)	-0.0384 (0.0583)
Stimulation	-0.0016*** (0.0004)	-0.0665** (0.0224)	0.0149 (0.0106)	-0.0012 (0.0023)	0.0464*** (0.0079)	0.0664 (0.0622)
Tradition	0.0008* (0.0003)	-0.0392 (0.0216)	0.0063 (0.0088)	-0.0002 (0.0019)	0.0103 (0.0073)	-0.0024 (0.0534)
Universalism	-0.0005 (0.0004)	-0.0203 (0.0258)	-0.0145 (0.0098)	-0.0041 (0.0023)	-0.0063 (0.0082)	-0.0952 (0.0600)
FR	-0.0011 (0.0007)	0.2004*** (0.0430)	0.0124 (0.0148)	0.0070* (0.0033)	-0.0743*** (0.0138)	0.1347 (0.0929)
IT	-0.0020** (0.0007)	0.1698*** (0.0383)	0.0838*** (0.0166)	0.0167*** (0.0038)	-0.0627*** (0.0137)	0.3486*** (0.0967)
PL	0.0032*** (0.0007)	-0.0038 (0.0433)	0.2352*** (0.0282)	0.0066 (0.0053)	-0.1310*** (0.0172)	0.9789*** (0.1322)
RO	0.0017* (0.0008)	-0.0760 (0.0459)	0.4099*** (0.0426)	-0.0280*** (0.0066)	-0.0365 (0.0192)	1.3753*** (0.1913)
ES	-0.0008 (0.0007)	0.0088 (0.0368)	0.0799*** (0.0181)	0.0075 (0.0039)	-0.0142 (0.0144)	0.3967*** (0.1018)
SE	-0.0030*** (0.0007)	0.2377*** (0.0425)	0.0116 (0.0146)	0.0033 (0.0033)	-0.0271* (0.0137)	0.1711 (0.1045)
UK	0.0013 (0.0007)	0.1556*** (0.0421)	0.0441** (0.0146)	0.0034 (0.0033)	-0.0582*** (0.0139)	0.1468 (0.0888)
ABreversed	0.0009** (0.0003)	0.0037 (0.0199)	-0.0142 (0.0084)	-0.0083*** (0.0019)	0.0249*** (0.0068)	-0.1758*** (0.0493)
Incentivized	-0.0007* (0.0004)	-0.1264*** (0.0234)	0.0641*** (0.0094)	-0.0268*** (0.0022)	-0.0143 (0.0076)	0.0156 (0.0556)
LowStakes	-0.0016** (0.0006)	-0.0880** (0.0341)	-0.0162 (0.0180)	0.0315*** (0.0047)	0.0171 (0.0130)	0.1053 (0.1078)
HighStakes	0.0006 (0.0006)	0.1009* (0.0497)	-0.0421** (0.0129)	-0.0088** (0.0032)	0.0403** (0.0129)	-0.0669 (0.0923)
Constant	0.0127*** (0.0011)	1.9238*** (0.0652)	0.2986*** (0.0241)	0.0349*** (0.0057)	0.4708*** (0.0226)	2.3085*** (0.1541)
N	443415					
Log. Likelihood	-252643					
BIC	507627					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.4: Robustness check: ε -normalization

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	-0.006*** (0.001)	-0.001*** (0.000)	-0.000* (0.000)	0.001* (0.000)	-0.004*** (0.001)
Male	-0.035** (0.012)	-0.143*** (0.030)	0.019* (0.008)	0.003 (0.002)	-0.006 (0.007)	0.077** (0.028)
Education	-0.018 (0.013)	0.001 (0.031)	-0.032*** (0.009)	0.001 (0.002)	-0.020** (0.007)	0.017 (0.031)
Income	-0.001** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.001*** (0.000)	0.002* (0.001)
Children	-0.013 (0.014)	-0.066 (0.035)	0.031** (0.009)	-0.002 (0.002)	0.024** (0.008)	0.028 (0.031)
Couple	-0.012 (0.014)	0.016 (0.036)	-0.001 (0.009)	0.001 (0.002)	0.001 (0.008)	0.021 (0.031)
Urban	-0.020 (0.012)	-0.009 (0.029)	0.008 (0.008)	0.003* (0.002)	0.020** (0.007)	0.033 (0.028)
CRT	-0.022*** (0.006)	0.028* (0.014)	-0.026*** (0.004)	-0.001 (0.001)	-0.063*** (0.003)	0.004 (0.013)
Achievement	-0.011 (0.016)	0.005 (0.034)	0.008 (0.011)	-0.000 (0.002)	0.009 (0.008)	0.008 (0.040)
Benevolence	0.001 (0.014)	0.035 (0.039)	-0.001 (0.010)	0.002 (0.002)	-0.006 (0.008)	-0.015 (0.033)
Conformity	0.002 (0.013)	0.019 (0.032)	-0.004 (0.009)	-0.004* (0.002)	0.013 (0.007)	-0.010 (0.032)
Hedonism	-0.022 (0.015)	-0.033 (0.032)	0.032*** (0.009)	0.002 (0.002)	-0.021** (0.007)	0.102** (0.036)
Power	0.030 (0.017)	0.042 (0.037)	-0.005 (0.011)	0.000 (0.002)	0.053*** (0.009)	-0.071 (0.041)
Security	-0.003 (0.015)	0.022 (0.035)	-0.004 (0.010)	-0.000 (0.002)	-0.014 (0.008)	-0.006 (0.036)
Self direction	-0.001 (0.014)	-0.032 (0.034)	0.006 (0.009)	-0.002 (0.002)	-0.031*** (0.008)	-0.011 (0.033)
Stimulation	-0.054*** (0.016)	-0.126*** (0.030)	0.023* (0.011)	-0.001 (0.002)	0.039*** (0.008)	0.123** (0.044)
Tradition	0.022 (0.013)	-0.035 (0.031)	0.002 (0.009)	0.000 (0.002)	0.017* (0.007)	-0.046 (0.032)
Universalism	-0.012 (0.014)	-0.039 (0.038)	-0.011 (0.010)	-0.004 (0.002)	-0.013 (0.008)	0.006 (0.033)
FR	-0.047 (0.027)	0.251*** (0.061)	0.018 (0.014)	0.006* (0.003)	-0.072*** (0.013)	0.094 (0.056)
IT	-0.077** (0.028)	0.194*** (0.054)	0.083*** (0.016)	0.016*** (0.003)	-0.063*** (0.013)	0.225*** (0.067)
PL	0.196*** (0.029)	0.044 (0.067)	0.064** (0.023)	0.007 (0.004)	-0.134*** (0.016)	-0.035 (0.052)
RO	0.103* (0.042)	-0.093 (0.065)	0.242*** (0.044)	-0.017*** (0.005)	-0.033 (0.018)	0.186 (0.105)
ES	-0.034 (0.028)	-0.001 (0.053)	0.075*** (0.018)	0.007 (0.004)	-0.018 (0.013)	0.204** (0.069)
SE	-0.110*** (0.027)	0.262*** (0.055)	0.019 (0.015)	0.003 (0.003)	-0.034** (0.013)	0.244*** (0.074)
UK	0.043 (0.027)	0.253*** (0.062)	0.031* (0.015)	0.003 (0.003)	-0.047*** (0.013)	-0.035 (0.051)
ABreversed	0.038** (0.012)	0.027 (0.028)	-0.019* (0.008)	-0.007*** (0.002)	0.023*** (0.006)	-0.100*** (0.028)
Incentivized	-0.044** (0.015)	-0.189*** (0.036)	0.064*** (0.010)	-0.023*** (0.002)	-0.014 (0.007)	0.083* (0.035)
LowStakes	-0.048* (0.023)	-0.146** (0.049)	-0.010 (0.017)	0.027*** (0.004)	0.014 (0.013)	0.102 (0.069)
HighStakes	0.022 (0.024)	0.157* (0.073)	-0.035** (0.013)	-0.007** (0.003)	0.033** (0.012)	-0.010 (0.048)
Constant	0.524*** (0.041)	2.270*** (0.098)	0.255*** (0.023)	0.031*** (0.005)	0.490*** (0.021)	0.619*** (0.082)
N	443415					
Log. Likelihood	-253087					
BIC	508515					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

discount rates are significantly larger between now and six months than between six and 12 months in the future (Wald test, $p < 0.001$). This is, however, merely a restatement of the finding that the present bias parameter is larger than zero in our main specification. Further, we find similar correlations of individual characteristics with both discount rates. Note that the coefficients of the individual characteristics on γ in our main specification can be interpreted as the differences in the effects on both discount rates. We will therefore not discuss these differences further here.

Separate estimation of time preferences: Our main specification assumes a discounted utility model, in which the elasticity of intertemporal substitution is determined by the parameter of relative risk aversion. To examine the sensitivity of our findings to this assumption, we estimate time preferences separately. To do so, we impose $\alpha = 0$ in Equation 1 and only use choices from MPL1.1 and MPL1.2 to estimate δ and γ . We report the findings of this model in Table D.7. Under the assumption that $\alpha = 0$, some correlations are no longer significant. Compared to the main model, discounting and present bias are no longer related to *Age*, and *Male*. Likewise, *Stimulation*, *ABreversed*, and *LowStakes* are no longer related to discounting, and *Urban* is no longer significantly related to present bias. On the other hand, some correlations turn out to be statistically significant, which were not statistically significant in the main specification. *Income* and *Universalism* are now negatively related to discounting, and *PL* is negatively related to present bias. Note however, that while several studies suggest that utility for risk and time preferences is not the same, the assumption that utility over time has no curvature ($\alpha = 0$) and is unrelated to utility over risk, appears strong.³⁶ Indeed, most studies find that utility over time is also concave, but exhibits less curvature than utility over risk. Also, recent findings suggest that utility over risk and time are different but correlated (Meissner and Pfeiffer, 2022). Therefore, the results of the robustness check presented above should be interpreted with caution.

D.3 Alternative error term specifications

As noted by Drichoutis and Lusk (2014), the specification of the error process may impact the preference estimates. We therefore change the error process in three ways compared to our main specification which employs a logit-link Fechner error and tremble. First, we use a probit-link Fechner error and tremble. Second, we run a model without a tremble error. Finally, we allow the Fechner error to differ between our MPLs.

³⁶Our setup does not allow to identify curvature of utility over time separately from time discounting. Therefore we cannot directly estimate this curvature.

Table D.5: Robustness check: no present bias

	Risk aversion α	Loss aversion λ	Discounting δ	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	-0.006*** (0.001)	-0.001*** (0.000)	0.001* (0.000)	-0.004*** (0.001)
Male	-0.035** (0.012)	-0.143*** (0.030)	0.022** (0.008)	-0.006 (0.007)	0.077** (0.028)
Education	-0.019 (0.014)	0.000 (0.031)	-0.031*** (0.009)	-0.019** (0.007)	0.018 (0.032)
Income	-0.001** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.001*** (0.000)	0.002* (0.001)
Children	-0.013 (0.014)	-0.065 (0.035)	0.028** (0.009)	0.024** (0.008)	0.028 (0.031)
Couple	-0.014 (0.015)	0.016 (0.035)	0.001 (0.009)	0.001 (0.008)	0.023 (0.032)
Urban	-0.021 (0.012)	-0.009 (0.029)	0.012 (0.008)	0.020** (0.007)	0.035 (0.028)
CRT	-0.022*** (0.006)	0.028* (0.014)	-0.028*** (0.004)	-0.063*** (0.003)	0.003 (0.013)
Achievement	-0.012 (0.016)	0.005 (0.034)	0.008 (0.010)	0.009 (0.008)	0.010 (0.041)
Benevolence	0.000 (0.015)	0.034 (0.039)	0.002 (0.010)	-0.005 (0.008)	-0.014 (0.034)
Conformity	0.002 (0.014)	0.020 (0.032)	-0.008 (0.009)	0.013 (0.007)	-0.008 (0.032)
Hedonism	-0.022 (0.015)	-0.033 (0.032)	0.034*** (0.009)	-0.021** (0.007)	0.104** (0.036)
Power	0.031 (0.017)	0.041 (0.037)	-0.005 (0.012)	0.054*** (0.009)	-0.074 (0.042)
Security	-0.002 (0.015)	0.022 (0.035)	-0.005 (0.010)	-0.014 (0.008)	-0.010 (0.036)
Self direction	-0.001 (0.014)	-0.032 (0.034)	0.002 (0.009)	-0.031*** (0.008)	-0.013 (0.033)
Stimulation	-0.056*** (0.016)	-0.125*** (0.030)	0.023* (0.011)	0.039*** (0.008)	0.127** (0.044)
Tradition	0.022 (0.013)	-0.035 (0.031)	0.002 (0.009)	0.017* (0.007)	-0.046 (0.032)
Universalism	-0.012 (0.014)	-0.038 (0.038)	-0.016 (0.010)	-0.013 (0.008)	0.006 (0.033)
FR	-0.047 (0.027)	0.251*** (0.061)	0.025 (0.014)	-0.071*** (0.013)	0.092 (0.056)
IT	-0.076** (0.028)	0.194*** (0.054)	0.103*** (0.017)	-0.063*** (0.013)	0.229*** (0.067)
PL	0.201*** (0.029)	0.047 (0.067)	0.073** (0.023)	-0.138*** (0.016)	-0.034 (0.053)
RO	0.105* (0.042)	-0.094 (0.065)	0.215*** (0.040)	-0.031 (0.018)	0.170 (0.103)
ES	-0.034 (0.028)	-0.001 (0.053)	0.084*** (0.018)	-0.019 (0.013)	0.207** (0.070)
SE	-0.111*** (0.027)	0.262*** (0.055)	0.024 (0.014)	-0.033* (0.013)	0.247*** (0.074)
UK	0.042 (0.027)	0.253*** (0.062)	0.035* (0.014)	-0.047*** (0.013)	-0.034 (0.051)
ABreversed	0.036** (0.012)	0.027 (0.028)	-0.026** (0.008)	0.024*** (0.006)	-0.092** (0.028)
Incentivized	-0.046** (0.015)	-0.189*** (0.036)	0.037*** (0.009)	-0.015* (0.007)	0.084* (0.035)
LowStakes	-0.046* (0.023)	-0.147** (0.049)	0.024 (0.018)	0.015 (0.013)	0.100 (0.069)
HighStakes	0.023 (0.025)	0.157* (0.073)	-0.044*** (0.013)	0.032** (0.012)	-0.013 (0.049)
Constant	0.525*** (0.041)	2.269*** (0.098)	0.293*** (0.023)	0.491*** (0.021)	0.619*** (0.083)
N	443415				
Log. Likelihood	-253239				
BIC	508428				

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.6: Robustness check: two discount rates

	Risk aversion α	Loss aversion λ	Discounting δ_1	Discounting δ_2	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	-0.006*** (0.001)	-0.002*** (0.000)	-0.001** (0.000)	0.001* (0.000)	-0.004*** (0.001)
Male	-0.035** (0.012)	-0.143*** (0.030)	0.026** (0.008)	0.019* (0.008)	-0.006 (0.007)	0.077** (0.028)
Education	-0.018 (0.013)	0.001 (0.031)	-0.031*** (0.009)	-0.033*** (0.009)	-0.019** (0.007)	0.017 (0.031)
Income	-0.001** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.001*** (0.000)	0.002* (0.001)
Children	-0.013 (0.014)	-0.066 (0.035)	0.025* (0.010)	0.030** (0.009)	0.024** (0.008)	0.027 (0.031)
Couple	-0.014 (0.014)	0.016 (0.035)	0.002 (0.010)	0.000 (0.009)	0.001 (0.008)	0.023 (0.031)
Urban	-0.021 (0.012)	-0.009 (0.029)	0.016 (0.009)	0.008 (0.008)	0.020** (0.007)	0.034 (0.028)
CRT	-0.022*** (0.006)	0.028* (0.014)	-0.028*** (0.004)	-0.027*** (0.004)	-0.063*** (0.003)	0.005 (0.013)
Achievement	-0.013 (0.016)	0.005 (0.034)	0.007 (0.011)	0.009 (0.010)	0.010 (0.008)	0.012 (0.040)
Benevolence	0.001 (0.015)	0.035 (0.039)	0.005 (0.010)	-0.002 (0.010)	-0.006 (0.008)	-0.016 (0.033)
Conformity	0.002 (0.014)	0.019 (0.032)	-0.013 (0.009)	-0.004 (0.009)	0.013 (0.007)	-0.009 (0.032)
Hedonism	-0.022 (0.015)	-0.034 (0.032)	0.037*** (0.010)	0.031*** (0.009)	-0.021** (0.007)	0.102** (0.036)
Power	0.031 (0.017)	0.042 (0.037)	-0.005 (0.012)	-0.005 (0.011)	0.053*** (0.009)	-0.075 (0.041)
Security	-0.003 (0.015)	0.022 (0.035)	-0.005 (0.010)	-0.005 (0.010)	-0.014 (0.008)	-0.007 (0.036)
Self direction	-0.001 (0.014)	-0.032 (0.034)	-0.000 (0.010)	0.005 (0.009)	-0.031*** (0.008)	-0.011 (0.033)
Stimulation	-0.055*** (0.016)	-0.126*** (0.030)	0.020 (0.011)	0.024* (0.011)	0.039*** (0.008)	0.126** (0.043)
Tradition	0.022 (0.013)	-0.035 (0.031)	0.003 (0.009)	0.001 (0.008)	0.017* (0.007)	-0.047 (0.032)
Universalism	-0.013 (0.014)	-0.039 (0.038)	-0.021* (0.010)	-0.011 (0.009)	-0.013 (0.008)	0.008 (0.033)
FR	-0.047 (0.027)	0.251*** (0.061)	0.034* (0.015)	0.016 (0.014)	-0.071*** (0.013)	0.092 (0.056)
IT	-0.076** (0.028)	0.194*** (0.054)	0.126*** (0.019)	0.081*** (0.016)	-0.063*** (0.013)	0.222*** (0.067)
PL	0.199*** (0.029)	0.045 (0.067)	0.081*** (0.024)	0.067** (0.022)	-0.135*** (0.016)	-0.039 (0.052)
RO	0.105* (0.042)	-0.093 (0.065)	0.192*** (0.038)	0.241*** (0.043)	-0.033 (0.018)	0.180 (0.104)
ES	-0.034 (0.028)	-0.001 (0.053)	0.093*** (0.019)	0.075*** (0.018)	-0.018 (0.013)	0.203** (0.069)
SE	-0.110*** (0.027)	0.262*** (0.055)	0.027 (0.015)	0.020 (0.014)	-0.033** (0.013)	0.244*** (0.073)
UK	0.042 (0.027)	0.252*** (0.062)	0.039* (0.015)	0.031* (0.014)	-0.047*** (0.013)	-0.035 (0.051)
ABreversed	0.038** (0.012)	0.027 (0.028)	-0.037*** (0.008)	-0.020* (0.008)	0.023*** (0.006)	-0.098*** (0.028)
Incentivized	-0.046** (0.015)	-0.189*** (0.036)	0.011 (0.010)	0.064*** (0.009)	-0.014 (0.007)	0.087* (0.035)
LowStakes	-0.047* (0.023)	-0.147** (0.050)	0.059** (0.019)	-0.010 (0.017)	0.014 (0.013)	0.099 (0.068)
HighStakes	0.023 (0.025)	0.158* (0.073)	-0.053*** (0.014)	-0.036** (0.013)	0.032** (0.012)	-0.010 (0.048)
Constant	0.527*** (0.041)	2.270*** (0.098)	0.329*** (0.025)	0.255*** (0.023)	0.489*** (0.021)	0.615*** (0.082)
N	443415					
Log. Likelihood	-253092					
BIC	508525					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.7: Robustness check: separate estimation of time preferences

	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	-0.001 (0.001)	-0.000 (0.000)	0.000 (0.001)	-0.005 (0.012)
Male	0.014 (0.016)	0.002 (0.003)	-0.003 (0.014)	0.050 (0.278)
Education	-0.077*** (0.018)	-0.001 (0.003)	-0.016 (0.015)	0.021 (0.335)
Income	-0.001*** (0.000)	-0.000 (0.000)	-0.001** (0.000)	-0.004 (0.006)
Children	0.055** (0.019)	-0.007 (0.004)	0.055** (0.017)	-0.605 (0.346)
Couple	-0.022 (0.019)	0.004 (0.004)	-0.026 (0.017)	0.300 (0.345)
Urban	0.004 (0.016)	0.005 (0.003)	0.003 (0.014)	0.299 (0.275)
CRT	-0.071*** (0.007)	0.000 (0.001)	-0.052*** (0.007)	-0.400** (0.143)
Achievement	-0.013 (0.019)	0.002 (0.004)	0.015 (0.017)	-0.434 (0.333)
Benevolence	-0.007 (0.018)	0.005 (0.004)	-0.014 (0.017)	-0.111 (0.319)
Conformity	0.001 (0.017)	-0.007* (0.004)	-0.009 (0.015)	0.480 (0.298)
Hedonism	0.050** (0.017)	-0.002 (0.003)	-0.011 (0.016)	0.243 (0.305)
Power	0.030 (0.023)	0.001 (0.004)	0.026 (0.021)	0.945* (0.447)
Security	-0.011 (0.017)	-0.001 (0.004)	0.006 (0.016)	-0.104 (0.298)
Self direction	0.023 (0.017)	-0.003 (0.004)	-0.048** (0.015)	0.342 (0.288)
Stimulation	-0.016 (0.019)	-0.002 (0.004)	0.058*** (0.016)	-0.546 (0.307)
Tradition	0.032 (0.017)	-0.000 (0.003)	0.025 (0.014)	-0.046 (0.281)
Universalism	-0.043* (0.018)	-0.007 (0.004)	0.004 (0.016)	-0.755* (0.314)
FR	0.005 (0.028)	0.011* (0.005)	-0.196*** (0.022)	1.043* (0.448)
IT	0.158** (0.055)	0.021*** (0.006)	-0.295** (0.100)	3.456 (1.982)
PL	0.941*** (0.110)	-0.063*** (0.015)	-1.013** (0.348)	21.751** (6.921)
RO	1.075*** (0.112)	-0.099*** (0.014)	-0.543*** (0.127)	12.902*** (2.702)
ES	0.145*** (0.038)	0.011 (0.006)	-0.063* (0.030)	1.733** (0.661)
SE	-0.034 (0.026)	0.004 (0.005)	-0.132*** (0.024)	0.463 (0.463)
UK	0.110*** (0.029)	0.006 (0.006)	-0.142*** (0.025)	1.432** (0.517)
ABreversed	0.002 (0.016)	-0.013*** (0.003)	0.021 (0.014)	0.160 (0.296)
Incentivized	0.119*** (0.019)	-0.044*** (0.004)	-0.031* (0.015)	0.433 (0.309)
LowStakes	-0.055 (0.034)	0.044*** (0.007)	0.008 (0.029)	0.327 (0.588)
HighStakes	-0.073*** (0.021)	-0.014* (0.005)	0.013 (0.024)	-0.119 (0.441)
Constant	0.567*** (0.048)	0.052*** (0.009)	0.464*** (0.044)	5.620*** (0.896)
N	177366			
Log. Likelihood	-99503			
BIC	200455			

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Probit-link Fechner error and tremble: First, we estimate the model assuming the difference in errors to be normally distributed: $F(\xi) = \Phi(\xi)$, where Φ represents the standard normal CDF. The results (see Table D.8) are virtually identical to those obtained with our main specification. *Male*, however, is no longer related to present bias.

No tremble error: Second, we estimate the model without a tremble error, using only a logit-link Fechner error. Because this specification of the error terms is often applied in the literature, the results from this specification may be more easily compared with previous literature than the results from our main specification. As can be seen in Table D.9, most of the individual characteristics that were significantly related with the preference parameters in our main specification are also statistically significant for the specification with the simpler error terms. Yet, *Stimulation*, *RO*, and *LowStakes* are no longer significantly related to risk aversion. *Age*, *Male*, *Urban* and *HighStakes* are no longer significantly related to present bias, and *Male* and *Stimulation* are no longer significantly associated with discounting. Some variables are statistically significant for this specification but not for our main specification. *Hedonism*, *FR* and *ES* are now negatively related to risk aversion. *Power* and *Tradition* are now positively related to risk aversion. *Children* and *RO* are now negatively related to loss aversion.

Three Fechner errors: Finally, different price lists, designed to elicit different domains of preference, may induce individuals to make different kinds of errors.³⁷ Therefore, we allow the Fechner error to vary between our three price list designs.³⁸ Because price list design should not affect the tremble error, we restrict the tremble error to be constant across all decisions. This leaves us with three Fechner error parameters (μ_1, μ_2, μ_3) for MPL1, MPL2 and MPL3, respectively. We display the findings of this model in Table D.10. Compared to our main specification of the error terms, we observe only few differences. *IT*, *PL*, and *RO* are no longer related to risk aversion, *CRT* and *IT* are no longer related to loss aversion, and *Education*, *Stimulation* and *UK* are no longer related to discounting. Allowing the Fechner error to vary across MPLs leads to two new statistically significant relations: *Power* is now positively related with risk aversion, *Hedonism* is now negatively related with risk aversion, and *Children* is negatively correlated with loss aversion.

³⁷For instance, MPLs may be “coarse” in the sense that the difference in expected utility between two adjacent rows may be larger or smaller in different MPLs. A larger difference might lead to larger estimates of the noise parameters.

³⁸Because the design of the first two price lists (MPL1.1 and MPL1.2) is identical, we restrict the Fechner error to be the same across these lists.

Table D.8: Robustness check: probit link

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	Fechner error μ
Age	0.002*** (0.001)	-0.006*** (0.001)	-0.001** (0.000)	-0.000* (0.000)	0.001* (0.000)	-0.006*** (0.002)
Male	-0.034** (0.012)	-0.146*** (0.030)	0.018* (0.008)	0.003 (0.002)	-0.006 (0.006)	0.127** (0.045)
Education	-0.017 (0.013)	-0.000 (0.032)	-0.033*** (0.009)	0.001 (0.002)	-0.020** (0.007)	0.027 (0.049)
Income	-0.001** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.001*** (0.000)	0.003* (0.001)
Children	-0.013 (0.014)	-0.066 (0.037)	0.031*** (0.009)	-0.003 (0.002)	0.024** (0.008)	0.050 (0.049)
Couple	-0.013 (0.014)	0.014 (0.036)	-0.000 (0.009)	0.001 (0.002)	0.001 (0.007)	0.038 (0.050)
Urban	-0.020 (0.012)	-0.007 (0.030)	0.008 (0.008)	0.003* (0.002)	0.020** (0.006)	0.051 (0.044)
CRT	-0.021*** (0.006)	0.028* (0.014)	-0.028*** (0.004)	-0.000 (0.001)	-0.063*** (0.003)	0.008 (0.021)
Achievement	-0.012 (0.016)	0.007 (0.034)	0.008 (0.010)	-0.000 (0.002)	0.009 (0.008)	0.017 (0.063)
Benevolence	0.000 (0.014)	0.033 (0.040)	-0.001 (0.010)	0.002 (0.002)	-0.006 (0.008)	-0.018 (0.053)
Conformity	0.002 (0.013)	0.020 (0.032)	-0.004 (0.009)	-0.004* (0.002)	0.013 (0.007)	-0.016 (0.050)
Hedonism	-0.022 (0.015)	-0.036 (0.033)	0.032*** (0.009)	0.001 (0.002)	-0.019** (0.007)	0.161** (0.058)
Power	0.029 (0.017)	0.039 (0.038)	-0.004 (0.011)	0.000 (0.002)	0.053*** (0.008)	-0.111 (0.065)
Security	-0.002 (0.014)	0.023 (0.035)	-0.005 (0.010)	-0.000 (0.002)	-0.015* (0.008)	-0.011 (0.057)
Self direction	-0.000 (0.014)	-0.033 (0.034)	0.005 (0.009)	-0.002 (0.002)	-0.032*** (0.007)	-0.016 (0.052)
Stimulation	-0.053*** (0.016)	-0.125*** (0.031)	0.023* (0.011)	-0.001 (0.002)	0.039*** (0.007)	0.194** (0.067)
Tradition	0.021 (0.013)	-0.034 (0.031)	0.002 (0.009)	0.000 (0.002)	0.016* (0.007)	-0.072 (0.050)
Universalism	-0.013 (0.014)	-0.035 (0.038)	-0.011 (0.009)	-0.003 (0.002)	-0.013 (0.008)	0.015 (0.052)
FR	-0.047 (0.026)	0.259*** (0.060)	0.017 (0.014)	0.006* (0.003)	-0.072*** (0.012)	0.160 (0.092)
IT	-0.073** (0.027)	0.194*** (0.056)	0.082*** (0.016)	0.014*** (0.003)	-0.062*** (0.012)	0.365*** (0.108)
PL	0.198*** (0.029)	0.040 (0.067)	0.067** (0.022)	0.004 (0.004)	-0.123*** (0.016)	-0.106 (0.085)
RO	0.103* (0.041)	-0.092 (0.067)	0.239*** (0.042)	-0.018*** (0.005)	-0.022 (0.017)	0.242 (0.163)
ES	-0.034 (0.028)	-0.002 (0.053)	0.075*** (0.018)	0.006 (0.003)	-0.016 (0.013)	0.317** (0.111)
SE	-0.111*** (0.026)	0.272*** (0.058)	0.019 (0.014)	0.003 (0.003)	-0.033** (0.013)	0.410*** (0.118)
UK	0.041 (0.026)	0.255*** (0.064)	0.032* (0.015)	0.002 (0.003)	-0.046*** (0.012)	-0.055 (0.083)
ABreversed	0.037** (0.012)	0.030 (0.029)	-0.018* (0.008)	-0.007*** (0.002)	0.023*** (0.006)	-0.160*** (0.044)
Incentivized	-0.043** (0.015)	-0.195*** (0.037)	0.063*** (0.009)	-0.022*** (0.002)	-0.014* (0.007)	0.135* (0.055)
LowStakes	-0.047* (0.023)	-0.147** (0.049)	-0.011 (0.017)	0.027*** (0.004)	0.014 (0.013)	0.163 (0.108)
HighStakes	0.021 (0.024)	0.163* (0.069)	-0.035** (0.013)	-0.007* (0.003)	0.034** (0.011)	-0.023 (0.077)
Constant	0.524*** (0.040)	2.277*** (0.097)	0.259*** (0.023)	0.029*** (0.005)	0.496*** (0.020)	1.026*** (0.133)
N	443415					
Log. Likelihood	-252908					
BIC	508157					

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.9: Robustness check: no tremble error

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Fechner error μ
Age	0.001** (0.000)	-0.006*** (0.001)	-0.001* (0.001)	-0.000 (0.000)	-0.003 (0.003)
Male	-0.036*** (0.010)	-0.134*** (0.024)	0.019 (0.011)	0.005 (0.002)	0.159* (0.063)
Education	-0.023 (0.012)	-0.007 (0.025)	-0.047*** (0.012)	0.003 (0.002)	0.016 (0.074)
Income	-0.001*** (0.000)	-0.002** (0.001)	-0.000 (0.000)	-0.000 (0.000)	0.003 (0.002)
Children	0.001 (0.011)	-0.069* (0.028)	0.039** (0.013)	-0.004 (0.003)	0.091 (0.071)
Couple	0.002 (0.011)	0.035 (0.028)	-0.011 (0.013)	0.001 (0.003)	-0.031 (0.071)
Urban	-0.008 (0.010)	-0.010 (0.023)	0.009 (0.012)	0.004 (0.002)	0.126 (0.066)
CRT	-0.033*** (0.005)	0.044*** (0.011)	-0.035*** (0.005)	0.002 (0.001)	-0.122*** (0.029)
Achievement	0.009 (0.016)	0.010 (0.028)	0.001 (0.016)	-0.000 (0.003)	-0.051 (0.104)
Benevolence	-0.004 (0.012)	0.044 (0.030)	0.004 (0.014)	0.004 (0.003)	0.011 (0.077)
Conformity	0.010 (0.013)	0.028 (0.026)	-0.011 (0.013)	-0.006* (0.003)	0.001 (0.081)
Hedonism	-0.040** (0.014)	-0.027 (0.027)	0.047*** (0.013)	-0.001 (0.003)	0.178 (0.095)
Power	0.044* (0.018)	-0.012 (0.030)	-0.012 (0.017)	0.000 (0.003)	-0.025 (0.121)
Security	-0.006 (0.014)	0.037 (0.028)	-0.002 (0.014)	0.000 (0.003)	-0.050 (0.088)
Self direction	-0.006 (0.013)	-0.009 (0.027)	0.008 (0.013)	-0.003 (0.003)	-0.115 (0.085)
Stimulation	-0.030 (0.020)	-0.108*** (0.027)	0.022 (0.018)	-0.001 (0.003)	0.350* (0.144)
Tradition	0.026* (0.013)	-0.036 (0.025)	0.004 (0.013)	-0.002 (0.002)	-0.083 (0.087)
Universalism	-0.009 (0.012)	-0.041 (0.028)	-0.019 (0.014)	-0.004 (0.003)	-0.027 (0.077)
FR	-0.078*** (0.023)	0.185*** (0.047)	0.016 (0.021)	0.009* (0.004)	0.223 (0.153)
IT	-0.087** (0.029)	0.095* (0.044)	0.109*** (0.026)	0.015** (0.005)	0.321 (0.211)
PL	0.065** (0.023)	0.018 (0.052)	0.133*** (0.029)	-0.005 (0.005)	-0.423*** (0.128)
RO	0.015 (0.039)	-0.133* (0.056)	0.356*** (0.067)	-0.041*** (0.008)	0.256 (0.280)
ES	-0.055* (0.027)	-0.029 (0.045)	0.090*** (0.026)	0.005 (0.005)	0.349 (0.193)
SE	-0.111*** (0.028)	0.179*** (0.047)	-0.001 (0.022)	0.003 (0.005)	0.646** (0.228)
UK	0.015 (0.023)	0.172*** (0.048)	0.045* (0.021)	-0.001 (0.004)	-0.191 (0.138)
ABreversed	0.044*** (0.010)	-0.003 (0.023)	-0.026* (0.011)	-0.013*** (0.002)	-0.193** (0.067)
Incentivized	-0.044** (0.014)	-0.142*** (0.026)	0.097*** (0.013)	-0.036*** (0.003)	0.153 (0.086)
LowStakes	-0.041 (0.022)	-0.124** (0.041)	-0.020 (0.025)	0.038*** (0.005)	0.304 (0.178)
HighStakes	0.030 (0.019)	0.136** (0.048)	-0.060*** (0.018)	-0.008 (0.004)	0.028 (0.111)
Constant	0.686*** (0.028)	2.235*** (0.070)	0.249*** (0.031)	0.040*** (0.007)	1.696*** (0.175)
N	443415				
Log. Likelihood	-261314				
BIC	524579				

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.001$, *** $p < 0.001$

Table D.10: Robustness check: three Fechner errors

	Risk aversion α	Loss aversion λ	Discounting δ	Present bias γ	Tremble error κ	F. error 1 μ_1	F. error 2 μ_2	F. error 3 μ_3
Age	0.002*** (0.001)	-0.007*** (0.002)	-0.001*** (0.000)	-0.000* (0.000)	-0.001 (0.001)	-0.004* (0.001)	-0.002 (0.001)	-0.013* (0.005)
Male	-0.041** (0.013)	-0.205*** (0.038)	0.019* (0.008)	0.004** (0.001)	0.022 (0.014)	0.074* (0.035)	0.031 (0.029)	-0.017 (0.113)
Education	-0.029 (0.016)	-0.031 (0.039)	-0.018 (0.010)	0.001 (0.001)	0.005 (0.017)	0.020 (0.041)	-0.027 (0.035)	-0.047 (0.130)
Income	-0.002*** (0.000)	-0.003** (0.001)	0.000 (0.000)	-0.000 (0.000)	0.001 (0.000)	0.001 (0.001)	0.001 (0.001)	0.007* (0.004)
Children	-0.013 (0.017)	-0.092* (0.044)	0.026** (0.010)	-0.002 (0.002)	0.027 (0.020)	0.032 (0.038)	0.052 (0.034)	0.051 (0.127)
Couple	0.007 (0.014)	0.041 (0.045)	-0.010 (0.010)	-0.000 (0.002)	0.001 (0.014)	-0.058 (0.037)	0.022 (0.032)	-0.104 (0.130)
Urban	-0.018 (0.013)	-0.002 (0.036)	0.008 (0.008)	0.003* (0.001)	0.014 (0.013)	0.060 (0.032)	0.061* (0.030)	0.300** (0.111)
CRT	-0.033* (0.013)	0.025 (0.018)	-0.014* (0.006)	0.000 (0.001)	-0.039** (0.013)	-0.006 (0.020)	-0.040** (0.014)	-0.016 (0.066)
Achievement	0.009 (0.018)	0.021 (0.043)	-0.002 (0.012)	-0.001 (0.002)	-0.011 (0.015)	-0.023 (0.054)	0.044 (0.045)	0.060 (0.186)
Benevolence	-0.002 (0.015)	0.056 (0.048)	-0.002 (0.010)	0.002 (0.002)	0.004 (0.017)	-0.044 (0.043)	-0.007 (0.039)	-0.008 (0.160)
Conformity	-0.003 (0.014)	0.030 (0.041)	-0.003 (0.009)	-0.003* (0.002)	0.024* (0.012)	-0.019 (0.041)	-0.022 (0.035)	-0.005 (0.146)
Hedonism	-0.036* (0.018)	-0.051 (0.042)	0.035*** (0.010)	0.001 (0.002)	-0.008 (0.016)	0.121** (0.045)	0.083* (0.038)	0.149 (0.159)
Power	0.046* (0.020)	0.025 (0.046)	-0.014 (0.013)	-0.001 (0.002)	0.030 (0.018)	-0.063 (0.058)	-0.043 (0.046)	-0.057 (0.187)
Security	-0.003 (0.015)	0.041 (0.043)	-0.001 (0.010)	0.001 (0.002)	0.000 (0.014)	0.004 (0.043)	-0.058 (0.039)	-0.095 (0.167)
Self direction	-0.011 (0.015)	-0.026 (0.043)	0.011 (0.010)	-0.002 (0.002)	-0.018 (0.014)	0.013 (0.039)	-0.064 (0.037)	-0.080 (0.139)
Stimulation	-0.043* (0.019)	-0.145*** (0.042)	0.017 (0.013)	-0.001 (0.002)	0.037* (0.016)	0.108 (0.060)	0.194*** (0.052)	0.417* (0.204)
Tradition	0.023 (0.014)	-0.054 (0.039)	0.002 (0.010)	-0.000 (0.001)	0.007 (0.013)	-0.021 (0.043)	-0.015 (0.035)	-0.234 (0.159)
Universalism	-0.011 (0.015)	-0.049 (0.045)	-0.011 (0.010)	-0.003 (0.002)	-0.018 (0.013)	-0.002 (0.042)	0.013 (0.036)	0.134 (0.161)
FR	-0.078 (0.047)	0.284*** (0.078)	0.017 (0.019)	0.005* (0.003)	-0.048 (0.047)	0.007 (0.083)	0.087 (0.059)	1.103** (0.337)
IT	-0.084 (0.048)	0.131 (0.072)	0.068** (0.022)	0.013*** (0.003)	-0.020 (0.044)	0.039 (0.090)	0.191** (0.071)	0.615 (0.359)
PL	0.106 (0.060)	0.010 (0.084)	0.076* (0.031)	0.002 (0.003)	-0.177** (0.068)	0.095 (0.078)	-0.011 (0.056)	-0.633* (0.274)
RO	0.081 (0.062)	-0.164 (0.088)	0.139*** (0.040)	-0.015*** (0.004)	-0.176 (0.090)	0.203 (0.116)	0.463*** (0.131)	0.152 (0.365)
ES	-0.069 (0.045)	-0.045 (0.070)	0.078** (0.025)	0.006 (0.003)	0.001 (0.035)	0.283* (0.122)	0.202** (0.073)	0.484 (0.354)
SE	-0.130** (0.045)	0.259*** (0.075)	0.014 (0.019)	0.001 (0.003)	0.001 (0.041)	0.076 (0.108)	0.267*** (0.079)	1.501*** (0.445)
UK	0.058 (0.048)	0.294*** (0.082)	0.004 (0.020)	0.001 (0.003)	-0.085 (0.046)	-0.113 (0.071)	-0.048 (0.049)	0.053 (0.285)
ABreversed	0.037** (0.013)	-0.002 (0.035)	-0.025** (0.009)	-0.006*** (0.002)	0.025 (0.013)	-0.112*** (0.034)	-0.089** (0.029)	-0.430*** (0.119)
Incentivized	-0.070*** (0.017)	-0.234*** (0.043)	0.072*** (0.011)	-0.019*** (0.002)	0.036* (0.016)	0.101* (0.046)	0.026 (0.037)	0.159 (0.146)
LowStakes	-0.068* (0.028)	-0.157** (0.058)	0.008 (0.020)	0.027*** (0.004)	0.032 (0.021)	0.191 (0.109)	0.131 (0.078)	0.519 (0.321)
HighStakes	0.023 (0.021)	0.221* (0.086)	-0.031** (0.012)	-0.006** (0.002)	-0.004 (0.024)	-0.006 (0.051)	0.054 (0.052)	0.244 (0.198)
Constant	0.667*** (0.075)	2.567*** (0.115)	0.202*** (0.030)	0.025*** (0.004)	0.229* (0.097)	0.687*** (0.100)	0.762*** (0.088)	3.040*** (0.348)
N	443415							
Log. Likelihood	-248914							
BIC	500949							

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D.4 Alternative measures of preferences

To derive our main results, we use maximum likelihood methods to estimate the preference parameters for a structural model capturing risk and time preferences. An alternative measure of preferences pertains to counting how often a participant makes specific choices in an MPL. For instance, when eliciting risk aversion, several studies use the number of less risky choices to measure risk aversion (see e.g. [Andersson et al., 2016](#), and references therein). Likewise, discounting may be measured by the number of times an individual prefers an early payment. In a similar vein, preferences may be measured by switch points, i.e. the point in an MPL where a respondent switches from choosing Option A to choosing Option B. Respondents who switch multiple times, however, must be excluded with this measure. There are a few apparent advantages of using such non-parametric measures. First, counting the number of e.g. less risky choices is simple and quick. Moreover, this method provides preference measures at an individual level, whereas the strategy employed for our main specification estimates preferences at the aggregate level only.³⁹

However, these alternative measures of preferences also have some disadvantages. First, they cannot properly take into account structural dependencies between different domains of preference. For instance, the number of times someone chooses the less risky option (Option A) in MPL3 should be determined by *both* loss aversion and risk aversion. Therefore, the number of times Option A is chosen does not properly identify loss aversion. Second, using these alternative measures typically does not allow to sufficiently control for decision noise. This argument is made convincingly in [Andersson et al. \(2016, 2020\)](#), who show that a failure to control for observed heterogeneity in decision noise leads to spurious correlations between preference measures and individual characteristics that are correlated with decision noise. To test whether using these alternative measures leads to spurious correlations in our setting, we conduct a simulation exercise in Appendix D.5. This exercise confirms that using, for example, the number of risky choices to measure risk aversion leads to spurious correlations with individual characteristics that are correlated with decision noise.

To facilitate comparability of our findings with those in the literature using these alternative measures of preferences, we have included regressions of these measures on our set of individual characteristics further below. We use the number of times Option A was chosen in MPL2 to measure risk aversion. Loss aversion is measured by the number of times Option A was chosen in MPL3, with the caveat highlighted above: this measures risk and loss aversion jointly. Time discounting is measured by the amount of impatient

³⁹In principle, structural maximum likelihood estimations can also be employed to estimate preferences at an individual level. However, this typically requires multiple different MPLs for each elicited preference parameter.

choices in MPL1.1 and MPL1.2, i.e. the number of times Option A was chosen. Present bias is measured by how discounting differs in the two time horizons of MPL1.1 and MPL1.2. We therefore measure present bias as the difference of the number of times Option A is chosen in MPL1.2 and MPL1.1. In Table D.11, we report regressions of our individual characteristics on these measures. In Table D.12, we report analogous specifications, dropping subjects who switch multiple times between Option A and B. In these regressions, the number of times a respondent chooses Option A can also be interpreted as the switch point.

As expected, results differ considerably between our main specification and the specifications using these alternative measures. These differences pertain, in particular, to covariates that can be expected to correlate with decision noise, such as age, education and CRT. For the reasons stated above and in Section D.5, we will not discuss these differences further. We interpret these differences as indicating decision noise, which must be controlled for, rather than as evidence that our main specification is not robust.

Table D.11: Robustness check: number of times Option A is chosen

	Risk aversion MPL2	Loss aversion MPL3	Discounting MPL1.1+MPL1.2	Present bias MPL1.2-MPL1.1
Age	0.005 (0.003)	-0.010*** (0.002)	-0.005 (0.003)	-0.003* (0.001)
Male	-0.197** (0.072)	-0.231*** (0.043)	0.023 (0.076)	0.061* (0.026)
Education	0.023 (0.076)	-0.012 (0.045)	-0.441*** (0.080)	0.017 (0.028)
Income	-0.002 (0.002)	-0.003** (0.001)	-0.007*** (0.002)	-0.001 (0.001)
Children	-0.185* (0.086)	-0.111* (0.052)	0.246** (0.092)	-0.042 (0.032)
Couple	-0.209* (0.086)	0.057 (0.052)	-0.083 (0.091)	-0.004 (0.032)
Urban	-0.153* (0.073)	0.005 (0.044)	0.055 (0.078)	0.028 (0.027)
CRT	0.223*** (0.034)	0.064** (0.021)	-0.365*** (0.038)	0.019 (0.012)
Achievement	-0.205* (0.086)	0.040 (0.051)	0.066 (0.092)	-0.013 (0.032)
Benevolence	0.033 (0.090)	0.061 (0.055)	0.022 (0.098)	0.064 (0.034)
Conformity	0.034 (0.081)	0.030 (0.049)	-0.153 (0.088)	-0.079** (0.031)
Hedonism	-0.039 (0.083)	-0.052 (0.050)	0.127 (0.088)	0.027 (0.031)
Power	-0.085 (0.090)	0.020 (0.054)	0.025 (0.096)	-0.004 (0.034)
Security	0.040 (0.086)	0.034 (0.052)	-0.012 (0.093)	0.012 (0.034)
Self direction	0.229** (0.083)	-0.025 (0.050)	0.116 (0.090)	-0.018 (0.032)
Stimulation	-0.510*** (0.084)	-0.169*** (0.050)	-0.105 (0.090)	-0.049 (0.031)
Tradition	0.143 (0.078)	-0.053 (0.047)	0.147 (0.084)	-0.009 (0.029)
Universalism	-0.065 (0.086)	-0.055 (0.052)	-0.229* (0.093)	-0.058 (0.033)
FR	0.115 (0.146)	0.358*** (0.090)	-0.214 (0.158)	0.162** (0.054)
IT	-0.292* (0.141)	0.168* (0.084)	0.669*** (0.150)	0.258*** (0.054)
PL	0.497** (0.159)	-0.016 (0.094)	1.779*** (0.175)	0.071 (0.060)
RO	-0.335 (0.174)	-0.245* (0.100)	1.685*** (0.181)	-0.154* (0.062)
ES	-0.242 (0.145)	-0.042 (0.087)	0.462** (0.161)	0.101 (0.057)
SE	-0.489*** (0.148)	0.340*** (0.089)	-0.579*** (0.160)	0.004 (0.056)
UK	0.432** (0.142)	0.305*** (0.087)	0.414** (0.155)	0.065 (0.055)
ABreversed	0.007 (0.070)	-0.039 (0.042)	-0.155* (0.075)	-0.187*** (0.026)
Incentivized	-0.105 (0.080)	-0.261*** (0.048)	0.153 (0.085)	-0.382*** (0.031)
LowStakes	-0.445** (0.139)	-0.205* (0.082)	0.049 (0.146)	0.388*** (0.053)
HighStakes	-0.027 (0.132)	0.184* (0.077)	-0.568*** (0.136)	-0.136** (0.050)
_cons	9.176*** (0.216)	4.401*** (0.127)	8.572*** (0.230)	0.596*** (0.081)
N	12669	12669	12669	12669
adj. R2	0.019	0.018	0.057	0.027
BIC	71080.359	57903.621	72572.135	45885.025

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.12: Robustness check: switch points

	Risk aversion MPL2	Loss aversion MPL3	Discounting MPL1.1+MPL1.2	Present bias MPL1.2-MPL1.1
Age	0.003 (0.004)	-0.009*** (0.002)	-0.006 (0.004)	-0.004** (0.001)
Male	-0.210** (0.081)	-0.218*** (0.049)	0.073 (0.085)	0.047 (0.027)
Education	-0.022 (0.086)	0.015 (0.052)	-0.438*** (0.089)	0.018 (0.029)
Income	-0.005* (0.002)	-0.003** (0.001)	-0.009*** (0.002)	-0.001 (0.001)
Children	-0.106 (0.097)	-0.133* (0.059)	0.324** (0.102)	-0.015 (0.033)
Couple	-0.129 (0.096)	0.062 (0.058)	-0.098 (0.101)	-0.012 (0.033)
Urban	-0.110 (0.082)	0.011 (0.050)	0.062 (0.086)	0.019 (0.028)
CRT	0.098** (0.038)	0.046* (0.023)	-0.418*** (0.041)	0.011 (0.013)
Achievement	-0.196* (0.096)	0.073 (0.058)	0.076 (0.101)	-0.034 (0.033)
Benevolence	-0.029 (0.100)	0.064 (0.061)	0.015 (0.108)	0.036 (0.035)
Conformity	0.013 (0.089)	0.015 (0.055)	-0.177 (0.096)	-0.087** (0.031)
Hedonism	-0.038 (0.092)	-0.053 (0.056)	0.192* (0.098)	0.051 (0.031)
Power	0.122 (0.103)	0.052 (0.063)	0.035 (0.108)	0.003 (0.035)
Security	-0.011 (0.096)	0.042 (0.059)	-0.049 (0.102)	-0.003 (0.034)
Self direction	0.207* (0.093)	-0.033 (0.056)	0.107 (0.098)	-0.017 (0.032)
Stimulation	-0.485*** (0.094)	-0.190*** (0.057)	-0.081 (0.100)	-0.038 (0.032)
Tradition	0.252** (0.085)	-0.046 (0.052)	0.223* (0.091)	0.013 (0.029)
Universalism	-0.060 (0.095)	-0.052 (0.058)	-0.250* (0.102)	-0.038 (0.033)
FR	0.017 (0.160)	0.335*** (0.099)	-0.219 (0.173)	0.175** (0.055)
IT	-0.311* (0.158)	0.106 (0.095)	0.660*** (0.167)	0.247*** (0.056)
PL	0.526** (0.180)	-0.041 (0.108)	1.929*** (0.196)	0.072 (0.061)
RO	-0.312 (0.208)	-0.392*** (0.118)	2.085*** (0.206)	-0.066 (0.064)
ES	-0.195 (0.162)	-0.140 (0.098)	0.574** (0.180)	0.143* (0.058)
SE	-0.522** (0.164)	0.346*** (0.100)	-0.565** (0.177)	0.048 (0.056)
UK	0.424** (0.155)	0.304** (0.096)	0.434* (0.170)	0.096 (0.057)
ABreversed	0.033 (0.079)	-0.041 (0.047)	-0.139 (0.083)	-0.122*** (0.027)
Incentivized	-0.089 (0.089)	-0.281*** (0.054)	0.144 (0.093)	-0.347*** (0.032)
LowStakes	-0.373* (0.155)	-0.223* (0.093)	0.163 (0.162)	0.377*** (0.053)
HighStakes	0.060 (0.149)	0.249** (0.088)	-0.531*** (0.153)	-0.170*** (0.051)
_cons	9.603*** (0.247)	4.440*** (0.147)	8.649*** (0.259)	0.605*** (0.084)
N	10571	10571	10571	10571
adj. R2	0.013	0.019	0.069	0.022
BIC	59782.565	49068.389	60810.559	36902.283

Standard errors (clustered at the subject level) in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

D.5 Simulations

The analysis in [Andersson et al. \(2016\)](#) revealed potential spurious correlations of risk preferences and individual characteristics that are correlated with decision noise. Building on these concerns, [Andersson et al. \(2020\)](#) propose elicitation and estimation methods that are robust to these spurious effects. They propose a balanced design of the multiple price lists, as well as structural estimations to model heterogeneity of noise. The design of our MPLs as well as the structural estimations in [Section 5.1](#) reflect these principles.

To test whether our MPLs and estimation mitigate the spurious correlation effects, we simulate decision data: For each simulated individual, we randomly draw preference and error parameters, according to the following data generating process:

$$\begin{aligned}\hat{\alpha} &\sim B(0, 0.912, 7, 7) \\ \hat{\lambda} &\sim B(0, 3.866, 7, 7) \\ \hat{\delta} &\sim B(0, 0.020, 7, 7) \\ \hat{\gamma} &\sim B(0, 0.562, 7, 7) \\ \hat{\kappa} &\sim B(0, 0.860, 7, 7) \\ \hat{\mu} &\sim B(0, 1.374, 7, 7),\end{aligned}$$

where B is the four parameter beta distribution. The first two arguments indicate the minimum and maximum value, and the last two arguments indicate the α and β parameters of the beta distribution. [Figure D.1](#) illustrates the probability density functions of the simulated preference parameters. We chose beta distributions because some of the parameters require distributions with limited support.⁴⁰ The distributions were parameterized such that the means matched the point estimates in [Table 7](#). Lower and upper limits were set to $-/+100\%$ of the respective mean, and the α and β parameters were set to 7, generating symmetric distributions.⁴¹

We then simulate individual choice profiles, based on the drawn preference parameters and the random utility model described in [section 5.1](#), using the decision situations from our MPLs. We then employ the maximum likelihood estimation from [section 5.1](#) to estimate preferences of the simulated subjects.

To test whether variables correlated with the error term may generate a spurious correlation, we used the randomly drawn realizations of the error parameters ($\hat{\kappa}$ and $\hat{\mu}$ for the tremble and Fechner error, respectively) as covariates. These covariates are, of course, perfectly correlated with the respective error parameters. In contrast, the

⁴⁰The tremble error κ , for instance, is a probability and therefore has to lie on the unit interval.

⁴¹Note that the main result outlined below is not sensitive to the parameterization of the distributions of preference parameters. Spurious correlations are also generated with no variance in the preference parameters (Though variance in the error parameters is necessary of course).

correlation between other covariates (such as measures of cognitive ability) and the error parameters should be much lower. In that sense, our approach is a rather strict test of potential spurious effects.

We simulate 20 experiments, with $n = 12.000$ subjects each, totaling $N = 420.000$ choices per experiment. Table D.13 summarizes the estimations using our preferred model (including a tremble error). Table D.14 displays estimations on the same data using a simplified model without the tremble error. Finally, Table D.15 contains the results of regressing the error parameters on an alternative measure of preferences: the number of times option A was chosen. Each row in the tables indicates one simulated experiment.

In the following, we will focus on spurious correlations of noise and risk preferences, though the argument is also relevant for other domains of preference. As is apparent from Tables D.13–D.15, not (or imperfectly) controlling for heterogeneity of decision noise leads to a serious bias of estimates. Using OLS to estimate the impact of noise on ‘the number of times Option A was chosen’ in MPL2 reveals a consistent and large negative effect of decision noise on risk aversion. This confirms the findings in Andersson et al. (2016) and is consistent with our findings when using the number of times Option A is chosen as a measure of risk aversion in our data. This finding therefore underlines the notion that this measure of risk aversion is not robust to spurious correlation effects.

Using structural maximum likelihood estimations, but omitting the tremble error also leads to spurious effects. In this case, we find consistent and large positive spurious correlations between risk aversion and the tremble error. This effect goes in the same direction as the effect we find using our survey data and estimations without the tremble error.

Finally, using our preferred model, i.e. a structural estimation with logit-link Fechner error and tremble error, removes any consistent spurious effects. Note that this finding is not self-evident, because design features of the used MPLs may still lead to spurious effects.

The results of this simulation exercise strengthens our belief that our main specification is best suited to control for decision noise, and that the remaining negative correlation of risk aversion and cognitive ability documented in Section 5.1 is not spurious. This interpretation, however, depends on the underlying structural model of decision noise being correct. Correctness of the underlying model can be ensured in a simulation exercise, but it is of course possible that our structural model is still misspecified, when applied to our survey data.

Figure D.1: Distributions of simulated preference parameters

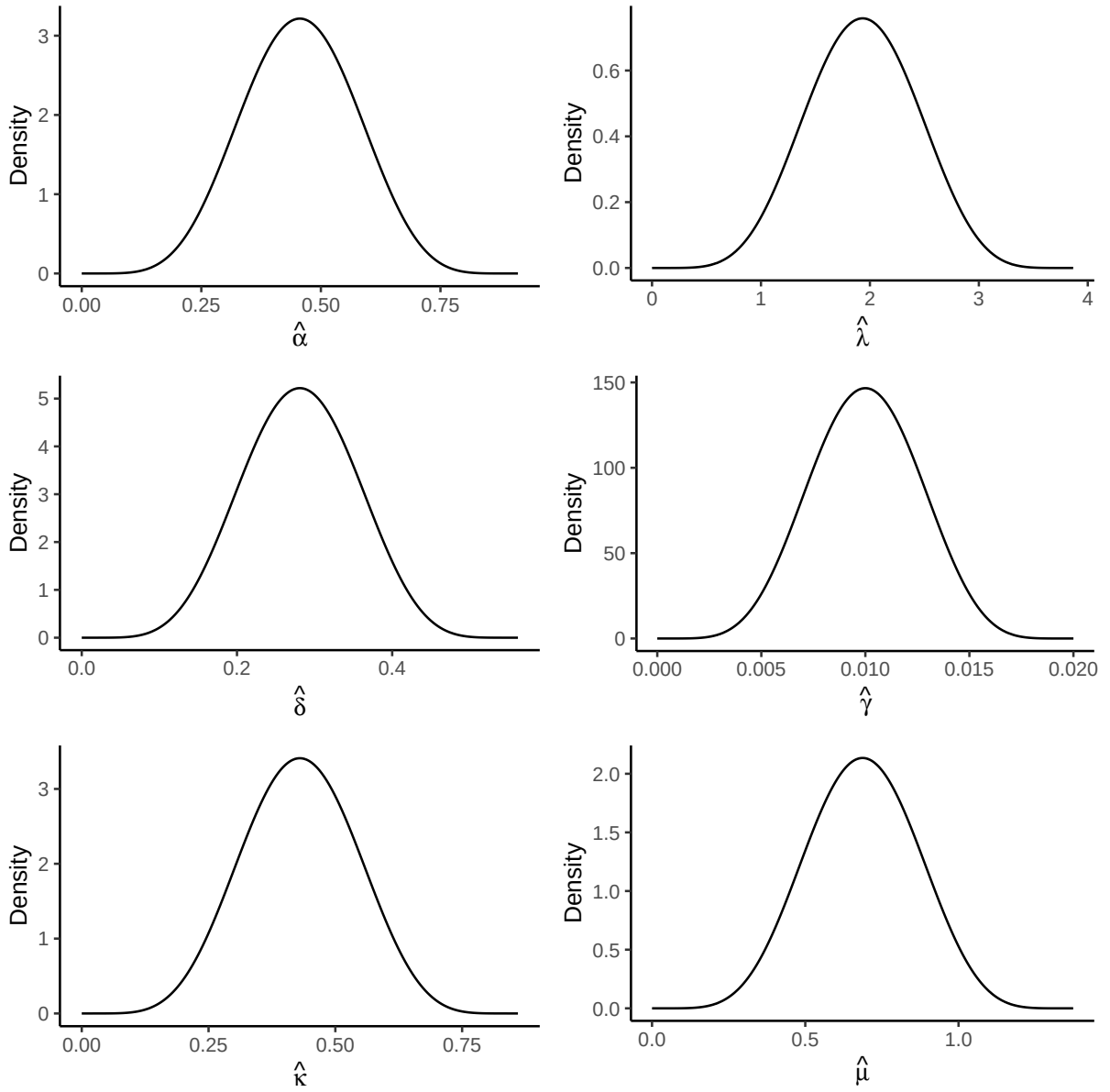


Table D.13: Simulations: main specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Risk aversion: α																				
$\hat{\kappa}$	-0.02 (0.03)	0.04 (0.03)	0.03 (0.03)	-0.02 (0.03)	-0.03 (0.03)	0.06 (0.03)	-0.05 (0.03)	0.00 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)	-0.00 (0.03)	-0.05 (0.03)	-0.04 (0.03)
$\hat{\mu}$	0.02 (0.02)	0.01 (0.02)	-0.00 (0.02)	-0.05** (0.02)	-0.03 (0.02)	-0.00 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.00 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.05** (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.01 (0.02)
Constant	0.44*** (0.02)	0.42*** (0.02)	0.44*** (0.02)	0.49*** (0.02)	0.47*** (0.02)	0.42*** (0.02)	0.49*** (0.02)	0.46*** (0.02)	0.46*** (0.02)	0.48*** (0.02)	0.47*** (0.02)	0.47*** (0.02)	0.46*** (0.02)	0.47*** (0.02)	0.45*** (0.02)	0.46*** (0.02)	0.48*** (0.02)	0.45*** (0.02)	0.48*** (0.02)	0.47*** (0.02)
Loss aversion: λ																				
$\hat{\kappa}$	0.02 (0.04)	0.05 (0.04)	0.03 (0.04)	-0.06 (0.04)	0.05 (0.05)	-0.05 (0.04)	0.02 (0.04)	-0.04 (0.05)	-0.09* (0.04)	0.03 (0.04)	0.05 (0.04)	0.12** (0.05)	-0.01 (0.04)	-0.06 (0.04)	-0.01 (0.04)	-0.08 (0.04)	0.06 (0.04)	-0.12** (0.04)	0.02 (0.04)	0.06 (0.04)
$\hat{\mu}$	-0.05* (0.03)	-0.04 (0.03)	-0.03 (0.03)	-0.05 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.05 (0.03)	-0.07** (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.07** (0.03)	-0.08** (0.03)	-0.05* (0.03)	-0.06* (0.03)	-0.04 (0.02)	-0.04 (0.02)	-0.03 (0.03)	-0.02 (0.03)	-0.07** (0.03)
Constant	1.99*** (0.02)	1.97*** (0.02)	1.97*** (0.02)	2.02*** (0.02)	1.96*** (0.02)	2.01*** (0.02)	1.99*** (0.02)	2.02*** (0.02)	2.02*** (0.02)	1.98*** (0.02)	1.96*** (0.02)	1.96*** (0.02)	2.02*** (0.02)	2.02*** (0.02)	2.03*** (0.02)	2.00*** (0.02)	2.02*** (0.02)	1.96*** (0.02)	2.03*** (0.02)	1.98*** (0.02)
Discounting: δ																				
$\hat{\kappa}$	0.02 (0.03)	0.00 (0.03)	0.00 (0.03)	-0.02 (0.03)	0.01 (0.03)	-0.03 (0.03)	0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.01 (0.03)	0.02 (0.03)	0.03 (0.03)	0.00 (0.03)	0.01 (0.03)	0.03 (0.03)	-0.05 (0.03)	-0.02 (0.03)	-0.04 (0.03)	0.08** (0.03)	0.01 (0.03)
$\hat{\mu}$	-0.01 (0.02)	0.00 (0.02)	0.02 (0.02)	0.02 (0.02)	-0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.01 (0.02)	-0.01 (0.02)	0.01 (0.02)	0.00 (0.02)	0.01 (0.02)	0.01 (0.02)	-0.01 (0.02)	0.00 (0.02)	0.02 (0.02)	0.03* (0.02)	-0.01 (0.02)	0.02 (0.02)	-0.01 (0.02)
Constant	0.27*** (0.01)	0.28*** (0.02)	0.27*** (0.01)	0.28*** (0.02)	0.28*** (0.01)	0.29*** (0.01)	0.26*** (0.01)	0.28*** (0.01)	0.30*** (0.02)	0.28*** (0.01)	0.27*** (0.02)	0.26*** (0.02)	0.28*** (0.01)	0.28*** (0.01)	0.27*** (0.01)	0.28*** (0.01)	0.27*** (0.01)	0.30*** (0.01)	0.24*** (0.01)	0.28*** (0.02)
Present bias: γ																				
$\hat{\kappa}$	-0.02 (0.01)	-0.01 (0.01)	-0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	0.02 (0.01)	0.02 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)	0.01 (0.01)	-0.03* (0.01)	0.00 (0.01)
$\hat{\mu}$	0.01 (0.01)	-0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.01* (0.01)	0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.00 (0.01)	0.00 (0.01)
Constant	0.01 (0.01)	0.02*** (0.01)	0.01 (0.01)	0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.01* (0.01)	0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.02* (0.01)	0.01 (0.01)	0.01* (0.01)	0.01* (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.02** (0.01)	0.01 (0.01)
Tremble error: κ																				
$\hat{\kappa}$	0.98*** (0.02)	0.95*** (0.02)	0.94*** (0.02)	0.95*** (0.02)	0.95*** (0.02)	0.93*** (0.02)	0.94*** (0.02)	0.92*** (0.02)	0.92*** (0.02)	0.98*** (0.02)	0.97*** (0.02)	0.96*** (0.02)	0.93*** (0.02)	0.94*** (0.02)	0.93*** (0.02)	0.94*** (0.02)	0.96*** (0.02)	0.95*** (0.02)	0.97*** (0.02)	0.98*** (0.02)
$\hat{\mu}$	0.03* (0.01)	0.03* (0.01)	0.00 (0.01)	0.06*** (0.01)	0.02 (0.01)	0.02 (0.01)	0.05*** (0.01)	0.03* (0.01)	0.01 (0.01)	0.03* (0.01)	0.02 (0.01)	0.02 (0.01)	0.00 (0.01)	0.04** (0.01)	0.02 (0.01)	0.04** (0.01)	0.03* (0.01)	0.03* (0.01)	0.02 (0.01)	0.04** (0.01)
Constant	0.03* (0.01)	0.04** (0.01)	0.06*** (0.01)	0.02 (0.01)	0.04** (0.01)	0.05*** (0.01)	0.02 (0.01)	0.05*** (0.01)	0.06*** (0.01)	0.02 (0.01)	0.03* (0.01)	0.04** (0.01)	0.05*** (0.01)	0.04** (0.01)	0.06*** (0.01)	0.04** (0.01)	0.03* (0.01)	0.04** (0.01)	0.04** (0.01)	0.02 (0.01)
Fechner error: μ																				
$\hat{\kappa}$	-0.15 (0.12)	-0.19 (0.11)	-0.01 (0.12)	-0.22 (0.12)	-0.02 (0.12)	-0.06 (0.12)	0.02 (0.12)	0.15 (0.12)	0.09 (0.11)	-0.14 (0.12)	-0.05 (0.11)	-0.04 (0.13)	0.19 (0.11)	-0.04 (0.12)	0.09 (0.12)	-0.11 (0.10)	-0.20 (0.12)	-0.11 (0.11)	0.06 (0.12)	-0.11 (0.12)
$\hat{\mu}$	0.87*** (0.07)	0.76*** (0.07)	0.98*** (0.08)	0.81*** (0.07)	0.95*** (0.07)	0.92*** (0.07)	0.76*** (0.07)	0.90*** (0.07)	0.90*** (0.07)	0.96*** (0.07)	0.89*** (0.07)	0.91*** (0.07)	0.99*** (0.07)	0.84*** (0.07)	0.96*** (0.07)	0.86*** (0.07)	0.97*** (0.07)	0.92*** (0.06)	0.88*** (0.07)	0.84*** (0.07)
Constant	0.22*** (0.06)	0.30*** (0.06)	0.09 (0.06)	0.28*** (0.06)	0.15* (0.06)	0.17** (0.06)	0.22*** (0.06)	0.09 (0.06)	0.13* (0.06)	0.15* (0.06)	0.17** (0.06)	0.17** (0.06)	0.04 (0.06)	0.20*** (0.06)	0.06 (0.06)	0.16** (0.06)	0.16** (0.06)	0.17** (0.05)	0.13* (0.06)	0.23*** (0.06)
N	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000

Standard errors in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.14: Simulations: no tremble error

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Risk aversion: α																				
$\hat{\kappa}$	0.21*** (0.02)	0.25*** (0.02)	0.20*** (0.02)	0.22*** (0.02)	0.21*** (0.02)	0.20*** (0.02)	0.18*** (0.02)	0.18*** (0.02)	0.16*** (0.02)	0.19*** (0.02)	0.21*** (0.02)	0.23*** (0.02)	0.17*** (0.02)	0.21*** (0.02)	0.19*** (0.02)	0.21*** (0.02)	0.23*** (0.02)	0.20*** (0.02)	0.20*** (0.02)	0.18*** (0.02)
$\hat{\mu}$	-0.01 (0.02)	-0.01 (0.02)	-0.03* (0.02)	-0.01 (0.02)	-0.03* (0.02)	0.00 (0.02)	0.00 (0.02)	-0.03* (0.02)	-0.00 (0.02)	-0.04* (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.05** (0.02)	-0.02 (0.02)	-0.05** (0.02)	-0.02 (0.02)
Constant	0.43*** (0.01)	0.41*** (0.01)	0.45*** (0.01)	0.42*** (0.01)	0.43*** (0.01)	0.42*** (0.01)	0.43*** (0.01)	0.45*** (0.01)	0.43*** (0.01)	0.45*** (0.01)	0.44*** (0.01)	0.43*** (0.01)	0.45*** (0.01)	0.44*** (0.01)	0.44*** (0.01)	0.43*** (0.01)	0.45*** (0.01)	0.44*** (0.01)	0.45*** (0.01)	0.44*** (0.01)
Loss aversion: λ																				
$\hat{\kappa}$	-0.26*** (0.06)	-0.23*** (0.06)	-0.25*** (0.06)	-0.33*** (0.06)	-0.17** (0.06)	-0.32*** (0.06)	-0.27*** (0.06)	-0.30*** (0.06)	-0.40*** (0.06)	-0.29*** (0.06)	-0.24*** (0.06)	-0.14* (0.06)	-0.27*** (0.06)	-0.32*** (0.06)	-0.35*** (0.06)	-0.30*** (0.06)	-0.24*** (0.06)	-0.42*** (0.06)	-0.25*** (0.06)	-0.23*** (0.06)
$\hat{\mu}$	0.03 (0.04)	0.04 (0.04)	-0.00 (0.04)	-0.01 (0.04)	0.03 (0.04)	0.06 (0.04)	0.01 (0.04)	0.02 (0.04)	0.05 (0.04)	0.07 (0.04)	0.04 (0.04)	-0.02 (0.04)	-0.01 (0.04)	0.02 (0.04)	0.03 (0.04)	0.00 (0.04)	0.01 (0.04)	0.01 (0.04)	0.02 (0.04)	0.02 (0.04)
Constant	1.85*** (0.04)	1.84*** (0.04)	1.87*** (0.04)	1.90*** (0.04)	1.82*** (0.04)	1.85*** (0.04)	1.86*** (0.04)	1.86*** (0.04)	1.90*** (0.04)	1.83*** (0.04)	1.83*** (0.04)	1.84*** (0.04)	1.89*** (0.04)	1.88*** (0.04)	1.89*** (0.04)	1.89*** (0.04)	1.86*** (0.04)	1.93*** (0.04)	1.85*** (0.04)	1.85*** (0.04)
Discounting: δ																				
$\hat{\kappa}$	-0.00 (0.03)	-0.06 (0.03)	-0.02 (0.03)	-0.09* (0.04)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.08* (0.03)	-0.09** (0.03)	-0.02 (0.03)	-0.01 (0.04)	-0.04 (0.04)	-0.04 (0.03)	-0.07 (0.03)	0.00 (0.03)	-0.09* (0.04)	-0.07* (0.03)	-0.12*** (0.03)	0.04 (0.04)	-0.03 (0.03)
$\hat{\mu}$	-0.06** (0.02)	-0.05* (0.02)	-0.03 (0.02)	-0.07** (0.02)	-0.08*** (0.02)	-0.09*** (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.10*** (0.02)	-0.04 (0.02)	-0.06** (0.02)	-0.04 (0.02)	-0.07** (0.02)	-0.08*** (0.02)	-0.07** (0.02)	-0.05* (0.02)	-0.04 (0.02)	-0.07** (0.02)	-0.02 (0.02)	-0.08*** (0.02)
Constant	0.36*** (0.02)	0.37*** (0.02)	0.34*** (0.02)	0.40*** (0.02)	0.39*** (0.02)	0.40*** (0.02)	0.37*** (0.02)	0.39*** (0.02)	0.43*** (0.02)	0.36*** (0.02)	0.36*** (0.02)	0.36*** (0.02)	0.38*** (0.02)	0.40*** (0.02)	0.37*** (0.02)	0.38*** (0.02)	0.37*** (0.02)	0.42*** (0.02)	0.32*** (0.02)	0.38*** (0.02)
Present bias: γ																				
$\hat{\kappa}$	-0.03* (0.01)	-0.02 (0.01)	-0.04* (0.01)	0.02 (0.01)	-0.00 (0.01)	-0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)	-0.02 (0.01)	-0.04* (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.02 (0.01)	0.01 (0.01)	-0.04** (0.01)	-0.01 (0.01)
$\hat{\mu}$	0.01 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.01 (0.01)	0.03** (0.01)	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.03** (0.01)	0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	0.01 (0.01)	0.02* (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.00 (0.01)	0.01 (0.01)
Constant	0.01 (0.01)	0.02 (0.01)	0.02 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	-0.02* (0.01)	0.01 (0.01)	0.02* (0.01)	0.01 (0.01)	-0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	-0.00 (0.01)	0.00 (0.01)	-0.01 (0.01)	0.02** (0.01)	0.00 (0.01)
Tremble error: κ																				
$\hat{\kappa}$	4.58*** (0.22)	4.22*** (0.22)	4.70*** (0.25)	4.38*** (0.24)	4.53*** (0.22)	4.68*** (0.24)	4.72*** (0.22)	4.81*** (0.22)	4.85*** (0.22)	4.83*** (0.22)	4.69*** (0.23)	4.54*** (0.24)	5.06*** (0.22)	4.53*** (0.23)	4.77*** (0.23)	4.53*** (0.23)	4.25*** (0.22)	4.61*** (0.23)	4.87*** (0.22)	4.96*** (0.22)
$\hat{\mu}$	1.01*** (0.15)	0.93*** (0.16)	1.19*** (0.16)	1.10*** (0.17)	1.16*** (0.16)	0.87*** (0.16)	0.88*** (0.18)	1.20*** (0.16)	0.74*** (0.16)	1.32*** (0.16)	1.14*** (0.17)	1.05*** (0.16)	1.18*** (0.16)	1.21*** (0.15)	1.08*** (0.16)	1.10*** (0.16)	1.32*** (0.17)	1.15*** (0.17)	1.26*** (0.16)	1.14*** (0.15)
Constant	0.14 (0.12)	0.40** (0.13)	0.01 (0.13)	0.23 (0.14)	0.12 (0.12)	0.23 (0.13)	0.20 (0.12)	-0.05 (0.12)	0.31* (0.12)	-0.12 (0.12)	0.03 (0.12)	0.16 (0.13)	-0.06 (0.12)	0.10 (0.12)	0.10 (0.12)	0.15 (0.12)	0.04 (0.12)	0.11 (0.13)	-0.06 (0.11)	-0.01 (0.12)
N	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000	420000

Standard errors in parentheses
 * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table D.15: Simulations: number of times option A is chosen

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Risk aversion:																				
MPL2																				
$\hat{\kappa}$	-2.17*** (0.13)	-2.10*** (0.14)	-2.12*** (0.14)	-1.94*** (0.14)	-2.09*** (0.13)	-2.06*** (0.13)	-2.22*** (0.14)	-2.30*** (0.14)	-2.36*** (0.14)	-2.28*** (0.14)	-2.30*** (0.14)	-2.18*** (0.14)	-2.28*** (0.14)	-2.12*** (0.13)	-2.21*** (0.13)	-2.07*** (0.13)	-2.11*** (0.14)	-2.27*** (0.13)	-2.46*** (0.13)	-2.31*** (0.13)
$\hat{\mu}$	-0.76*** (0.08)	-0.63*** (0.09)	-0.70*** (0.09)	-0.67*** (0.08)	-0.79*** (0.08)	-0.61*** (0.09)	-0.72*** (0.09)	-0.78*** (0.09)	-0.75*** (0.09)	-0.77*** (0.08)	-0.82*** (0.09)	-0.73*** (0.09)	-0.65*** (0.09)	-0.85*** (0.08)	-0.78*** (0.09)	-0.80*** (0.09)	-0.88*** (0.09)	-0.71*** (0.08)	-0.87*** (0.08)	-0.72*** (0.08)
Constant	9.76*** (0.08)	9.61*** (0.08)	9.68*** (0.08)	9.57*** (0.08)	9.71*** (0.08)	9.58*** (0.08)	9.75*** (0.08)	9.81*** (0.08)	9.78*** (0.08)	9.81*** (0.08)	9.83*** (0.08)	9.72*** (0.08)	9.69*** (0.08)	9.78*** (0.08)	9.76*** (0.08)	9.74*** (0.08)	9.82*** (0.08)	9.75*** (0.08)	9.93*** (0.08)	9.76*** (0.08)
Loss aversion:																				
MPL3																				
$\hat{\kappa}$	0.20 (0.10)	0.20 (0.10)	0.07 (0.10)	-0.05 (0.10)	0.22* (0.10)	0.10 (0.10)	0.06 (0.10)	0.09 (0.10)	-0.05 (0.10)	0.10 (0.10)	0.16 (0.10)	0.22* (0.10)	0.12 (0.10)	0.05 (0.10)	-0.10 (0.10)	0.09 (0.10)	0.17 (0.10)	-0.06 (0.10)	0.17 (0.10)	0.18 (0.10)
$\hat{\mu}$	0.07 (0.06)	0.10 (0.07)	-0.03 (0.06)	-0.01 (0.06)	0.04 (0.06)	0.11 (0.06)	0.07 (0.07)	0.05 (0.07)	0.05 (0.06)	0.10 (0.06)	0.07 (0.06)	0.01 (0.06)	0.01 (0.06)	0.07 (0.06)	0.06 (0.06)	0.00 (0.06)	0.02 (0.07)	0.06 (0.06)	0.05 (0.07)	0.08 (0.06)
Constant	3.30*** (0.06)	3.30*** (0.06)	3.43*** (0.06)	3.46*** (0.06)	3.33*** (0.06)	3.32*** (0.06)	3.35*** (0.06)	3.35*** (0.06)	3.43*** (0.06)	3.32*** (0.06)	3.32*** (0.06)	3.34*** (0.06)	3.39*** (0.06)	3.37*** (0.06)	3.44*** (0.06)	3.41*** (0.06)	3.35*** (0.06)	3.41*** (0.06)	3.34*** (0.06)	3.32*** (0.06)
Discounting:																				
MPL1.1+MPL1.2																				
$\hat{\kappa}$	-1.23*** (0.15)	-1.34*** (0.15)	-1.42*** (0.15)	-1.26*** (0.16)	-1.27*** (0.15)	-1.44*** (0.15)	-1.25*** (0.15)	-1.48*** (0.15)	-1.62*** (0.15)	-1.37*** (0.15)	-1.45*** (0.15)	-1.20*** (0.15)	-1.43*** (0.15)	-1.49*** (0.15)	-1.18*** (0.15)	-1.47*** (0.16)	-1.47*** (0.15)	-1.68*** (0.15)	-1.23*** (0.15)	-1.33*** (0.15)
$\hat{\mu}$	-0.66*** (0.10)	-0.71*** (0.09)	-0.52*** (0.10)	-0.69*** (0.10)	-0.69*** (0.09)	-0.73*** (0.10)	-0.64*** (0.10)	-0.74*** (0.10)	-0.71*** (0.10)	-0.62*** (0.09)	-0.82*** (0.09)	-0.61*** (0.10)	-0.76*** (0.10)	-0.79*** (0.09)	-0.75*** (0.09)	-0.60*** (0.10)	-0.64*** (0.10)	-0.79*** (0.09)	-0.61*** (0.10)	-0.81*** (0.10)
Constant	8.80*** (0.09)	8.87*** (0.09)	8.79*** (0.09)	8.84*** (0.10)	8.83*** (0.09)	8.94*** (0.10)	8.77*** (0.10)	8.95*** (0.09)	8.98*** (0.09)	8.84*** (0.09)	8.99*** (0.10)	8.73*** (0.09)	8.95*** (0.09)	8.98*** (0.09)	8.85*** (0.09)	8.82*** (0.09)	8.88*** (0.09)	9.06*** (0.09)	8.76*** (0.09)	8.92*** (0.09)
Present bias:																				
MPL1.2-MPL1.1																				
$\hat{\kappa}$	-0.39** (0.14)	-0.49*** (0.14)	-0.65*** (0.14)	-0.01 (0.14)	-0.22 (0.14)	-0.45*** (0.14)	-0.18 (0.14)	-0.20 (0.13)	-0.09 (0.13)	-0.35* (0.14)	-0.48*** (0.14)	-0.21 (0.14)	-0.30* (0.14)	-0.35** (0.14)	-0.31* (0.14)	-0.16 (0.14)	-0.42** (0.14)	-0.08 (0.14)	-0.60*** (0.14)	-0.27** (0.14)
$\hat{\mu}$	-0.00 (0.09)	-0.13 (0.08)	0.00 (0.09)	0.04 (0.09)	0.15 (0.09)	0.05 (0.09)	-0.02 (0.09)	-0.02 (0.09)	0.11 (0.09)	-0.01 (0.08)	-0.04 (0.09)	-0.07 (0.09)	0.04 (0.09)	0.11 (0.08)	-0.03 (0.09)	0.08 (0.09)	0.02 (0.09)	-0.03 (0.09)	-0.06 (0.09)	0.02 (0.09)
Constant	0.30*** (0.08)	0.44*** (0.08)	0.41*** (0.08)	0.12 (0.08)	0.14 (0.08)	0.32*** (0.08)	0.28*** (0.08)	0.24** (0.08)	0.10 (0.08)	0.31*** (0.08)	0.37*** (0.08)	0.30*** (0.08)	0.24** (0.08)	0.22** (0.08)	0.32*** (0.08)	0.16 (0.08)	0.30*** (0.08)	0.18* (0.08)	0.45*** (0.08)	0.24*** (0.08)
N	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Standard errors in parentheses																				
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$																				