

Online Appendix: Privacy Concerns in Responses to Sensitive Questions. A Survey Experiment on the Influence of Numeric Codes on Unit Nonresponse, Item Nonresponse, and Misreporting

A1 Results for GFE items

A1.1 Regression tables for item nonresponse

The impact of a numeric code on the questionnaire on nonresponse in GFE-items is modeled logistic for the probability of at least one missing in the sensitive questions and using Quasi-Poisson for the number of missings if there is at least one answer to a sensitive questions missing (table A1.1).

table A1.1 Regression tables for item nonresponse

		Logistic regression	Quasi-Poisson regression
		dependent variable: at least one missing in the GFE-items	dependent variable: number of missing answers if there is at least one missing
(Intercept)		-15.566 (0.981)	0.008 (0.997)
Scanner code group (reference category: no scanner code)	with scanner code, without notice	0.855 (0.001)	0.205 (0.557)
	with scanner code and notice	0.692 (0.003)	0.008 (0.997)
City district of residence in Munich (reference category: Altstadt-Lehel)	Ludwigsvorstadt-Isarvorstadt	11.965 (0.981)	--
	Maxvorstadt	13.022 (0.985)	1.287 (0.997)
	Schwabing-West	13.851 (0.984)	0.508 (0.584)
	Au-Haidhausen	13.660 (0.983)	0.437 (0.839)
	Sendling	13.310 (0.983)	2.071 (0.379)
	Sendling-Westpark	12.836 (0.984)	0.688 (0.781)
	Schwanthalerhöhe	13.734 (0.984)	0.656 (0.782)
	Neuhausen-Nymphenburg	13.620 (0.983)	1.065 (0.782)
	Moosach	13.462 (0.983)	1.291 (0.592)
	Milbertshofen-Am Hart	13.894 (0.984)	1.319 (0.567)
	Schwabing-Freimann	12.351 (0.984)	1.769 (0.451)
	Bogenhausen	13.477 (0.983)	0.761 (0.744)
	Berg am Laim	13.182 (0.984)	0.544 (0.827)
	Trudering-Riem	12.960 (0.984)	1.159 (0.620)
	Ramersdorf-Perlach	13.226 (0.984)	0.564 (0.812)
	Obergiesing-Fasangarten	12.835 (0.984)	0.160 (0.949)
	Untergiesing-Harlaching	12.213 (0.985)	1.783 (0.473)
	Thalkirchen-Obersendling-Forstenried-Fürstenried-Solln	12.888 (0.984)	1.076 (0.646)
	Hadern	13.600 (0.983)	0.841 (0.717)
Pasing-Obermenzing	13.763 (0.983)	0.232 (0.923)	
Aubing-Lochhausen-Langwied	13.536 (0.983)	0.184 (0.429)	
Allach-Untermenzing	13.514 (0.983)	-0.000 (1.000)	
Feldmoching-Hasenberg	-0.692 (0.999)	--	
Laim	13.912 (0.983)	0.205 (0.557)	
n		1136	185

p-values are in parentheses; As in some city districts have no observations with at least one of the GFE-items missing, these are excluded from the model

A1.2 Regression tabel for misreporting

Table A1.2 shows the effect of the numeric code and notice controlling for socio-demographics and city district of residence in an OLS-regression. The dependent variable is an index of standardized GFE-items.

table A1.2 Regression tabels for misreporting

		OLS-regression
		dependent variable: index of standardized GFE-items
(Intercept)		0.100 (0.001)
Scanner code group	with scanner code, without notice	-0.101 (0.036)
(reference category: no scanner code)	with scanner code and notice	-0.096 (0.026)
Sex: male		0.130 (< 0.001)
Age		-0.036 (< 0.001)
Age squared		3.999e-4 (< 0.001)
Religion:	roman catholic	0.099 (0.015)
(reference category: no religious affiliation)	Lutheran-protestant	-0.0747 (0.089)
	other	0.131 (0.162)
German citizenship		-0.043 (0.562)
Education	middle school ("Realschule") degree	-0.008 (0.904)
(reference category: no or lower secondary school degree)	adv.tech. college qualification	-0.174 (0.046)
	university qualification	-0.332 (< 0.001)
	university degree	-0.310 (< 0.001)
Employment status:	reg. part-time employment	-0.081 (0.143)
(Reference category: full-time employment)	marginal part-time employment	-0.058 (0.412)
	not employed	-0.089 (0.120)
Unemployment experience		-0.050 (0.162)
Income per capita (in 1000 Euro)		2.941e-4(0.986)
City district of residence in Munich	Ludwigsvorstadt-Isarvorstadt	-0.196 (0.374)
(reference category: Altstadt-Lehel)	Maxvorstadt	-0.228 (0.294)
	Schwabing-West	-0.096 (0.718)
	Au-Haidhausen	-0.120 (0.587)
	Sendling	0.036 (0.878)
	Sendling-Westpark	-0.157 (0.486)
	Schwanthalerhöhe	-0.128 (0.564)
	Neuhausen-Nymphenburg	-0.124 (0.564)
	Moosach	0.888 (0.703)
	Milbertshofen-Am Hart	-0.057 (0.792)
	Schwabing-Freimann	0.004 (0.987)
	Bogenhausen	0.258 (0.248)
	Berg am Laim	0.164 (0.520)
	Trudering-Riem	0.007 (0.739)
	Ramersdorf-Perlach	0.210 (0.343)
	Obergiesing-Fasangarten	-0.122 (0.572)
	Untergiesing-Harlaching	-0.315 (0.198)
	Thalkirchen-Obersendling-Forstenried- Fürstenried-Solln	-0.029 (0.896)
	Hadern	0.012 (0.957)
	Pasing-Obermenzing	-0.159 (0.476)
	Aubing-Lochhausen-Langwied	-0.016 (0.942)
	Allach-Untermenzing	-0.100 (0.653)
	Feldmoching-Hasenberg1	--
	Laim	-0.036 (0.872)
n		925
R ²		0.238
Adjusted R ²		0.026
p-values are calculated heteroscedasticity consistent (White, 1980); As city district Feldmoching- Hasenberg1 has no observations in this model, the district is excluded		

A1.3 Regression table, impact on GFE-regression results

Table A1.3 contains a GFE-regression for xenophobia. All independent variables are interacted with the numeric code groups to examine the impact of numeric codes and explanations of these codes on GFE-regression results. Details on theoretical reasons of variable selections and operationalization can be found in (Steinbeißer, Bader, Ganser, & Schmitt, 2013). Some interaction effects could not be estimated due the number of cases in city districts.

table A1.3 Regression table, impact on GFE-regression results

		OLS-regression		
		dependent variable: xenophobia		
		Main effects	Interactions with numeric code, without notice	Interactions with numeric code, with notice
(Intercept)		0.572 (< 0.001)		
Scanner code group (reference category: no scanner code)	with scanner code, without notice with scanner code and notice	-0.067 (0.77)		
Sex: male		0.024 (0.076)	-0.059 (0.028)	0.031 (0.281)
Age		-0.007 (0.033)	0.008 (0.182)	0.004 (0.572)
Age squared		0.000 (0.027)	-8.180e-5 (0.209)	-3.361e-5 (0.604)
Religion: (reference category: no religious affiliation)	roman catholic Lutheran-protestant other	0.017 (0.256) -0.025 (0.180) -0.099 (0.038)	0.074 (0.011) 0.056 (0.117) 0.179 (0.029)	-0.004 (0.885) 0.019 (0.588) 0.116 (0.183)
German citizenship		-0.010 (0.774)	0.049 (0.415)	0.023 (0.747)
Education (reference category: no or lower secondary school degree)	middle school ("Realschule") degree adv.tech. college qualification university qualification university degree	-0.016 (0.546) -0.033 (0.382) -0.045 (0.119) -0.063 (0.015)	-0.015 (0.772) -0.031 (0.655) -0.017 (0.753) 0.016 (0.735)	0.078 (0.134) 0.115 (0.096) 0.084 (0.153) 0.080 (0.119)
Employment status: (Reference category: full-time employment)	reg. part-time employment marginal part-time employment not employed	-0.018 (0.362) -0.010 (0.718) -0.045 (0.069)	-0.047 (0.233) 0.084 (0.114) 0.054 (0.251)	0.032 (0.431) 0.018 (0.728) 0.030 (0.49)
Unemployment experience		-0.017 (0.236)	0.007 (0.811)	0.015 (0.585)
Income per capita (in 1000 Euro)		-0.003 (0.629)	0.002 (0.836)	0.006 (0.623)
Sense of belonging:	to Germany to Europe	0.039 (0.035) -0.047 (0.002)	-0.029 (0.418) -0.004 (0.883)	0.011 (0.765) 0.002 (0.947)
Contact to foreigners	in the family at work	0.008 (0.56) -0.066 (0.002)	-0.021 (0.386) -0.01 (0.807)	-0.054 (0.051) 0.054 (0.206)
Politically involved		0.141 (< 0.001)	-0.007 (0.900)	0.001 (0.980)
Trust in government		-0.049 (0.129)	0.015 (0.807)	-0.024 (0.694)
Social participation		-0.025 (0.488)	0.033 (0.595)	0.118 (0.138)
'Getting my fair share'		-0.004 (0.564)	0.005 (0.697)	0.015 (0.264)
Socio-economic comparison		0.081 (0.126)	0.108 (0.318)	-0.126 (0.279)
Sentiment during childhood		0.034 (0.233)	0.055 (0.309)	-0.069 (0.225)
City district of residence in Munich (reference category: Altstadt-Lehel)	Ludwigsvorstadt-Isarvorstadt Maxvorstadt Schwabing-West Au-Haidhausen Sendling Sendling-Westpark Schwanthalerhöhe Neuhausen-Nymphenburg Moosach Milbertshofen-Am Hart Schwabing-Freimann Bogenhausen Berg am Laim Trudering-Riem Ramersdorf-Perlach Obergiesing-Fasangarten Untergiesing-Harlaching Thalkirchen-Obersendling-Forstenried-Fürstenried-Solln Hadern Pasing-Obermenzing Aubing-Lochhausen-Langwied Allach-Untermenzing Feldmoching-Hasenberg Laim	0.02 (0.794) 0.027 (0.713) 0.007 (0.937) 0.041 (0.589) 0.018 (0.811) -0.013 (0.870) 0.016 (0.836) 0.041 (0.569) 0.060 (0.441) 0.119 (0.118) 0.059 (0.423) 0.062 (0.457) 0.096 (0.278) 0.058 (0.685) 0.129 (0.096) 0.015 (0.839) 0.015 (0.869) 0.037 (0.619) 0.017 (0.844) -0.020 (0.791) 0.101 (0.185) -0.018 (0.830) -- 0.019 (0.802)	-0.026 (0.808) -0.024 (0.804) 0.044 (0.724) -0.268 (0.05) -0.21 (0.251) -0.247 (0.137) -0.236 (0.109) -0.317 (0.028) 0.015 (0.923) -0.250 (0.118) -0.338 (0.015) -0.243 (0.08) -0.264 (0.073) -0.268 (0.133) -0.332 (0.016) -0.255 (0.073) -0.299 (0.075) -0.321 (0.020) -0.342 (0.020) 0.084 (0.409) -0.077 (0.454) -0.012 (0.916) -- -0.026 (0.808)	-- -- -- -- -0.004 (0.980) 0.071 (0.525) 0.067 (0.526) -0.021 (0.818) -- -0.076 (0.431) 0.075 (0.468) 0.036 (0.742) -- 0.018 (0.915) -0.222 (0.162) 0.012 (0.927) -0.088 (0.586) 0.012 (0.901) 0.08 (0.444) -- -- -- --
n		706		
R ²		0.435		
Adjusted R ²		0.295		

p-values are in parentheses; City districts are not used for analyses of effects on regression parameters, they are only for correction of randomization errors; For some city districts there were no observations to interact, these interactions are excluded

A2 Results for less sensitive items

Used less sensitive items were life-satisfaction and finance, trust in institutions, and good neighborhood. These items fulfilled the requirements of having an presumed direction of social desirability. These items are use as test group in order to notice biased answers for less sensitive items. The urge to give socially acceptable answers is not as strong in these topics as in GFE.

A2.1 Item nonresponse

Figure A2.1 shows item nonresponse for these items. Respondents with numeric code and notice to the code refused to respond to these items slightly more often. The group without notice had an almost identical item nonresponse as the group without numeric code.

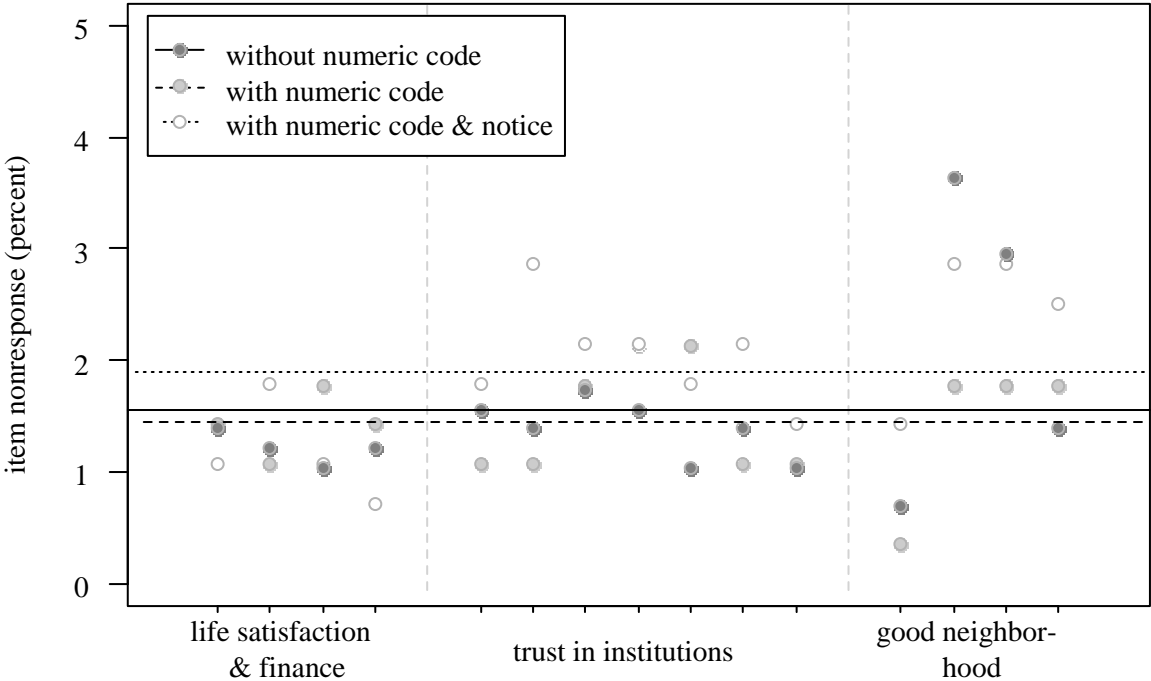


Figure A2.1: Item nonresponse rates (percent) for several less sensitive items with average nonresponse lines by treatment groups

The observation of no significant group-differences also holds for a logistic regression of the probability to have at least one missing in these items and a Quasi-Poisson model of the number of missing answers if there is at least one missing (see table A2.1). In some city districts there were no observations with at least one of the less sensitive items missing. Therefore some parameters could not be estimated.

table A2.1 Regression labels for item nonresponse, less sensitive items

		Logistic regression	Quasi-Poisson regression
		dependent variable: at least one missing in the less sensitive items	dependent variable: number of missing answers if there is at least one missing
(Intercept)		0,405 (0,444)	0,511 (0,359)
Scanner code group (reference category: no scanner code)	with scanner code, without notice	-0,090 (0,636)	0,030 (0,833)
	with scanner code and notice	0,438 (0,009)	0,088 (0,471)
City district of residence in Munich (reference category: Altstadt-Lehel)	Ludwigsvorstadt-Isarvorstadt	-2,165 (0,037)	-0,511 (0,516)
	Maxvorstadt	-1,239 (0,199)	-0,292 (0,637)
	Schwabing-West	-0,796 (0,447)	0,156 (0,810)
	Au-Haidhausen	-1,162 (0,226)	0,479 (0,415)
	Sendling	-0,223 (0,822)	0,134 (0,824)
	Sendling-Westpark	-0,906 (0,358)	-0,159 (0,800)
	Schwanthalerhöhe	-0,963 (0,326)	-0,218 (0,730)
	Neuhausen-Nymphenburg	-0,801 (0,392)	0,036 (0,951)
	Moosach	-0,439 (0,659)	-0,375 (0,560)
	Milbertshofen-Am Hart	-0,269 (0,777)	-0,112 (0,847)
	Schwabing-Freimann	-0,995 (0,292)	0,036 (0,951)
	Bogenhausen	-1,084 (0,255)	0,231 (0,694)
	Berg am Laim	-1,190 (0,254)	0,450 (0,485)
	Trudering-Riem	-0,609 (0,527)	-0,386 (0,526)
	Ramersdorf-Perlach	-0,251 (0,793)	-0,182 (0,760)
	Obergiesing-Fasangarten	-1,018 (0,286)	-0,148 (0,806)
	Untergiesing-Harlaching	-1,070 (0,301)	0,265 (0,680)
	Thalkirchen-Obersendling- Forstenried-Fürstenried-Solln	-0,720 (0,447)	-0,195 (0,741)
	Hadern	-0,645 (0,499)	-0,252 (0,671)
	Pasing-Obermenzing	-0,837 (0,388)	-0,501 (0,429)
Aubing-Lochhausen-Langwied	-0,658 (0,495)	0,125 (0,833)	
Allach-Untermenzing	-1,691 (0,108)	-0,547 (0,488)	
Feldmoching-Hasenbergl	11,723 (0,971)	-0,599 (0,662)	
Laim	-1,082 (0,266)	0,163 (0,788)	
n		1136	184

p-values are in parentheses; As in some city districts have no observations with at least one of the GFE-items missing, these are excluded from the model

A2.2 Misreporting

Table A1.2 shows the linear regression effect of the numeric code and notice on less sensitive items. The Regression is controlled for socio-demographics and city district of residence. The dependent variable is an index of standardized less sensitive-items.

table A2.2 Regression tables for misreporting, less sensitive items

		OLS-regression
		dependent variable: index of standardized less sensitive items
(Intercept)		0.247 (0.202)
Scanner code group (reference category: no scanner code)	with scanner code, without notice with scanner code and notice	0.032 (0.484) 0.039 (0.372)
Sex: male		0.022 (0.48)
Age		0.013 (0.047)
Age squared		0 (0.074)
Religion: (reference category: no religious affiliation)	roman catholic Lutheran-protestant other	-0.239 (< 0.001) -0.242 (< 0.001) -0.082 (0.44)
German citizenship		-0.096 (0.16)
Education (reference category: no or lower secondary school degree)	middle school ("Realschule") degree adv.tech. college qualification university qualification university degree	-0.06 (0.303) -0.042 (0.625) -0.099 (0.148) -0.17 (0.003)
Employment status: (Reference category: full-time employment)	reg. part-time employment marginal part-time employment not employed	-0.001 (0.979) -0.047 (0.417) -0.027 (0.603)
Unemployment experience		-0.124 (< 0.001)
Income per capita (in 1000 Euro)		-0.09 (< 0.001)
City district of residence in Munich (reference category: Laim)	Altstadt-Lehel Ludwigsvorstadt-Isarvorstadt Maxvorstadt Schwabing-West Au-Haidhausen Sendling Sendling-Westpark Schwanthalerhöhe Neuhausen-Nymphenburg Moosach Milbertshofen-Am Hart Schwabing-Freimann Bogenhausen Berg am Laim Trudering-Riem Ramersdorf-Perlach Obergiesing-Fasangarten Untergiesing-Harlaching Thalkirchen-Obersendling- Forstenried-Fürstenried-Solln Hadern Pasing-Obermenzing Aubing-Lochhausen-Langwied Allach-Untermenzing Feldmoching-Hasenberg	-0.64 (< 0.001) 0.173 (0.056) 0.012 (0.887) 0.132 (0.377) -0.053 (0.562) -0.081 (0.468) -0.231 (0.008) -0.03 (0.789) 0.048 (0.533) 0.144 (0.195) -0.17 (0.053) 0.046 (0.615) 0.077 (0.385) 0.159 (0.283) -0.145 (0.123) 0.008 (0.932) 0.098 (0.287) 0.195 (0.269) -0.13 (0.135) 0.051 (0.57) 0.014 (0.888) 0.214 (0.045) -0.065 (0.586) --
n		925
R ²		0.195
Adjusted R ²		0.158
p-values are calculated heteroscedasticity consistent (White, 1980); As city district Feldmoching-Hasenberg has no observations in this model, the district is excluded		

Under control of socio-demographics and city district of residence the difference is still visible (Figure A2.2) but is very small.

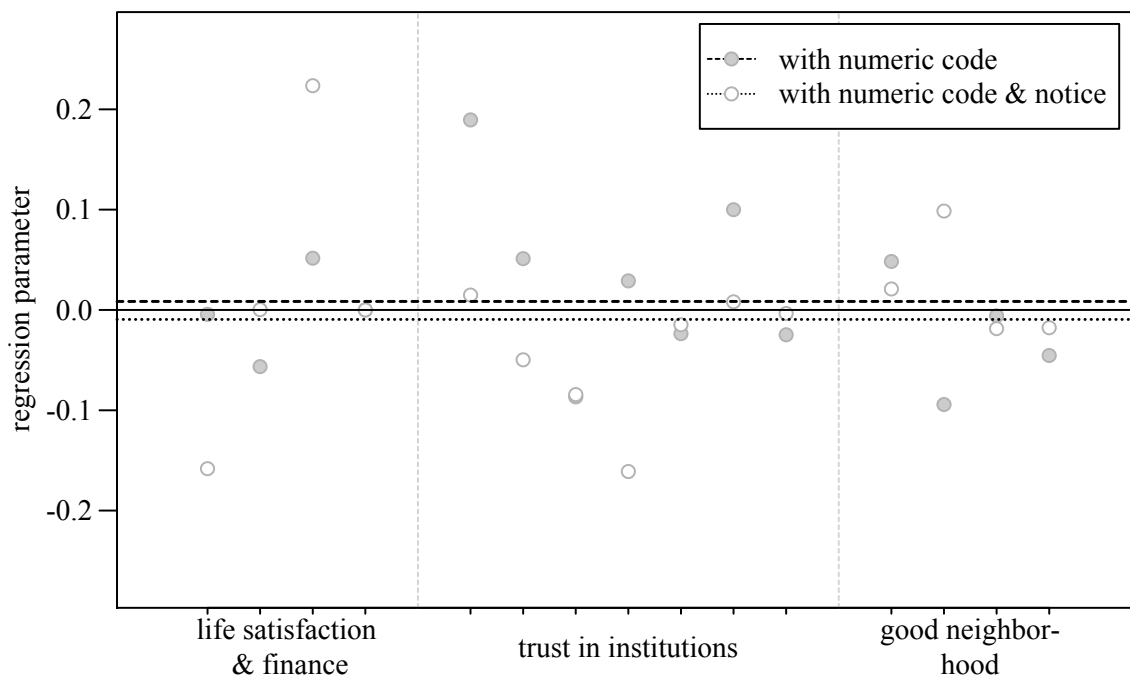


Figure A2.2: Parameters of the treatment group dummy variables (ref: no numeric code) from regressions for less sensitive items controlling socio-demographics and city district of residence with average answers by treatment groups

References

- Steinbeißer, D., Bader, F., Ganser, C., & Schmitt, L. (2013). *Gruppenbezogene Menschenfeindlichkeit in München: Forschungsbericht des Instituts für Soziologie der Ludwig-Maximilians-Universität München*. Retrieved from <http://www.ls4.soziologie.uni-muenchen.de/forschung/gmf>.
- White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*, 48(4), 817–838.