

Supplemental online material

Table S1. Descriptive statistics for all study variables by age group.

Variable	18-29 years		30-64 years		65+ years	
	<i>M</i> or <i>n</i>	<i>SD</i> or %	<i>M</i> or <i>n</i>	<i>SD</i> or %	<i>M</i> or <i>n</i>	<i>SD</i> or %
Sex						
male	159	48.5	716	45.8	249	45.3
female	169	51.5	846	54.2	301	54.7
Age	25.06	2.98	47.25	10.23	73.43	6.85
Race-ethnicity						
minority group	137.8	42.0	490.2	31.4	102	18.5
non-Hispanic White	190.2	58.0	1071.8	68.6	448	81.5
Household-size adjusted annual log-income	9.92	1.25	10.40	1.05	10.39	1.03
Years of education	13.78	2.20	14.04	2.88	13.65	3.25
Work status						
no job	29	8.8	101	6.5	12	2.2
other	70	21.3	244.4	15.6	56	10.2
retired	0	0.0	120	7.7	377	68.5
with job	229	69.8	1096.6	70.2	105	19.1
Household size						
1 person	53	16.2	326	20.9	236	42.9
2 persons	101	30.8	553	35.4	252	45.8
3+ persons	174	53.0	683	43.7	62	11.3
Children in household						
with kids	85	25.9	485.6	31.1	26.6	4.8
without kids	243	74.1	1076.4	68.9	523.4	95.2
Marital status						
married	60	18.3	804	51.5	228.2	41.5
widowed	0	0.0	51	3.3	153	27.8

divorced or separated	15	4.6	363	23.2	138.4	25.2
never married	253	77.1	344	22.0	30.4	5.5
Self-rated health	2.98	0.82	2.89	0.80	2.76	0.83
Religious engagement	2.25	1.93	2.89	2.26	3.44	2.61
Frequency of spending time with friends	4.64	1.36	3.99	1.51	3.47	1.65
Frequency of spending time with relatives	4.84	1.65	4.55	1.72	4.46	1.74
Frequency of spending time with neighbors	3.79	2.10	3.31	1.98	3.44	2.03
Loneliness	1.96	0.81	1.90	0.83	1.85	0.82

Notes. Descriptive statistics are pooled across five imputed data sets. Descriptive statistics for the original data with missing values are provided in the online supplemental material. For categorical variables, absolute frequencies (*n*) and percentages (%) are provided for each category. For continuous variables, means (*M*) and standard deviations (*SD*) are provided.

Table S2. Descriptive statistics for all study variables in the original sample (with missing values) and in the imputed samples (without missing values).

Variable	Original data		Imputed data	
	<i>M</i> or <i>n</i>	<i>SD</i> or %	<i>M</i> or <i>n</i>	<i>SD</i> or %
Sex				
male	1124	46.1	1124	46.1
female	1316	53.9	1316	53.9
Age	50.16	17.06	50.16	17.06
Race-ethnicity				
minority group	727	29.9	730	29.9
non-Hispanic White	1704	70.1	1710	70.1
Household-size adjusted annual log-income	10.33	1.08	10.33	1.08
Years of education	13.92	2.89	13.92	2.89
Work status				
no job	142	5.8	142	5.8
other	370	15.2	370.4	15.2
retired	497	20.4	497	20.4
with job	1430	58.6	1430.6	58.6
Household size				
1 person	615	25.2	615	25.2
2 persons	906	37.1	906	37.1
3+ persons	919	37.7	919	37.7
Children in household				
with kids	589	24.5	597.2	24.5
without kids	1816	75.5	1842.8	75.5
Marital status				
married	1091	44.7	1092.2	44.8
widowed	204	8.4	204	8.4
divorced or separated	516	21.2	516.4	21.2

never married	627	25.7	627.4	25.7
Self-rated health	2.88	0.81	2.87	0.82
Religious engagement	2.93	2.33	2.93	2.33
Frequency of spending time with friends	3.91	1.57	3.96	1.56
Frequency of spending time with relatives	4.58	1.70	4.57	1.72
Frequency of spending time with neighbors	3.38	1.99	3.40	2.01
Loneliness	1.90	0.82	1.90	0.82

Notes. Descriptive statistics for imputed data are pooled across five imputed data sets. For categorical variables, absolute frequencies (n) and percentages (%) are provided for each category. For continuous variables, means (M) and standard deviations (SD) are provided.

Table S3. Moderated regression model exploring interactions between all predictor variables and survey year in predicting loneliness.

Predictor	Estimate	SE	<i>t</i>	<i>p</i>
(Intercept)	-0.12	0.17	-0.72	0.470
Survey year: 2018	-0.01	0.24	-0.03	0.975
Age	0.00	0.00	-0.44	0.658
Age ²	0.00	0.00	-1.21	0.227
Sex: female	0.00	0.06	-0.06	0.950
Race-ethnicity: non-Hispanic White	0.12	0.06	1.92	0.056
Adjusted annual income	-0.08	0.03	-2.52	0.013
Years of education	0.01	0.01	1.34	0.180
Work status: other	0.32	0.13	2.53	0.011
Work status: retired	0.12	0.14	0.84	0.402
Work status: with job	0.07	0.11	0.57	0.567
Household size: 2 persons	-0.32	0.09	-3.63	0< .001
Household size: 3+ persons	-0.22	0.10	-2.21	0.027
Living without children	0.12	0.09	1.35	0.177
Marital status: widowed	0.45	0.13	3.46	0.001
Marital status: separated/divorced	0.21	0.08	2.53	0.011
Marital status: never married	0.22	0.09	2.45	0.015
Self-rated health	-0.16	0.04	-4.25	0< .001
Religious engagement	0.01	0.01	0.45	0.651
Frequency of spending time with friends	0.00	0.02	0.11	0.910
Frequency of spending time with relatives	-0.04	0.02	-1.68	0.110
Frequency of spending time with neighbors	-0.04	0.02	-1.87	0.085
Survey year x Age	0.00	0.00	-0.68	0.500
Survey year x Age ²	0.00	0.00	0.70	0.487
Survey year x Sex: female	0.01	0.08	0.09	0.930
Survey year x Race-ethnicity: non-Hispanic White	-0.09	0.09	-1.04	0.297

Survey year x Adjusted annual income	0.04	0.04	0.90	0.369
Survey year x Years of education	-0.01	0.01	-0.79	0.432
Survey year x Work status: other	-0.50	0.18	-2.77	0.006
Survey year x Work status: retired	-0.46	0.20	-2.35	0.019
Survey year x Work status: with job	-0.27	0.16	-1.68	0.094
Survey year x Household size: 2 persons	0.20	0.13	1.56	0.119
Survey year x Household size: 3+ persons	0.17	0.15	1.12	0.265
Survey year x Living without children	-0.14	0.14	-1.06	0.292
Survey year x Marital status: widowed	0.22	0.20	1.12	0.261
Survey year x Marital status: separated/divorced	0.30	0.12	2.47	0.014
Survey year x Marital status: never married	0.34	0.12	2.81	0.005
Survey year x Self-rated health	-0.10	0.05	-1.84	0.069
Survey year x Religious engagement	0.01	0.02	0.58	0.561
Survey year x Frequency of spending time with friends	0.00	0.04	-0.01	0.992
Survey year x Frequency of spending time with relatives	-0.04	0.03	-1.56	0.123
Survey year x Frequency of spending time with neighbors	0.02	0.03	0.94	0.358

Notes. Categorical variables were dummy-coded with 0 for 2014 (survey year), male (sex), minority group (race-ethnicity), no job (work status), 1-person household (household size), and married (marital status). Continuous predictors were centered on the on the grand mean (computed across the two waves) prior to these analyses. The outcome variable loneliness was standardized on the grand mean and grand standard deviation (computed across the two waves).

Table S4. Regression models for absolute and age-normative predictors: Wave 2014.

Predictor	Model 1			Model 2			Model 3		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
(Intercept)	-0.12	0.16	.483	0.12	0.11	.278	-0.03	0.18	.855
Age	-0.001	0.00	.559	0.00	0.00	.301	0.00	0.00	.125
Age ²	-0.0001	0.00	.212	0.00	0.00	.306	0.00	0.00	.092
Sex: female	-0.004	0.06	.949	-0.02	0.05	.654	-0.09	0.06	.130
Race-ethnicity: non-Hispanic White	0.12	0.06	.048	0.13	0.06	.037	0.15	0.06	.018
Adjusted annual income	-0.08	0.03	.011				-0.10	0.05	.030
Years of education	0.01	0.01	.166				0.02	0.01	.120
Work status: other	0.32	0.12	.009				0.38	0.13	.003
Work status: retired	0.12	0.13	.386				0.19	0.16	.212
Work status: with job	0.07	0.11	.553				0.05	0.15	.753
Household size: 2 persons	-0.32	0.09	.000				-0.31	0.09	.001
Household size: 3+ persons	-0.22	0.10	.022				-0.18	0.10	.094
Living without children	0.12	0.09	.165				0.14	0.10	.158
Marital status: widowed	0.45	0.13	.000				0.42	0.14	.002
Marital status: separated/divorced	0.21	0.08	.009				0.13	0.10	.180
Marital status: never married	0.22	0.09	.012				0.21	0.09	.023
Self-rated health	-0.16	0.04	.000				-0.18	0.04	.000
Religious engagement	0.01	0.01	.640				-0.02	0.02	.270
Frequency of spending time with friends	0.00	0.02	.907				-0.01	0.02	.714
Frequency of spending time with relatives	-0.04	0.02	.105				-0.04	0.02	.115
Frequency of spending time with neighbors	-0.04	0.02	.083				-0.04	0.02	.083

Deviation from normative adjusted annual income	0.02	0.01	.143	-0.02	0.02	.299
Deviation from normative years of education	0.00	0.00	.348	0.00	0.00	.747
Normative work status	-0.10	0.06	.106	0.07	0.10	.478
Normative household size	-0.04	0.06	.529	0.01	0.06	.870
Normative children-in-household status	-0.04	0.06	.512	-0.09	0.07	.214
Normative marital status	-0.31	0.06	.000	-0.13	0.07	.055
Deviation from normative self-rated health	0.05	0.03	.140	-0.02	0.04	.660
Deviation from normative religious engagement	0.00	0.00	.519	0.01	0.00	.113
Deviation from normative frequency of spending time with friends	0.00	0.01	.993	-0.01	0.01	.597
Deviation from normative frequency of spending time with relatives	0.00	0.01	.710	-0.01	0.01	.308
Deviation from normative frequency of spending time with neighbors	-0.01	0.01	.370	-0.01	0.01	.386

Notes. Categorical variables were dummy-coded with 0 for male (sex), minority group (race-ethnicity), no job (work status), 1-person household (household size), and married (marital status). Normative categorical variables were dummy-coded with 0 = non-normative status and 1 = normative status. Continuous predictors were centered on the on the grand mean (computed within this wave) prior to these analyses. Normative continuous predictors reflect the squared deviation from the reference value. The outcome variable loneliness was standardized on the grand mean and grand standard deviation.

Table S5. Regression models for absolute and age-normative predictors: Wave 2018.

Predictor	Model 1			Model 2			Model 3		
	Estimate	SE	p	Estimate	SE	p	Estimate	SE	p
(Intercept)	-0.13	0.18	.468	0.52	0.15	.001	0.48	0.21	.025
Age	-0.004	0.00	.230	0.00	0.00	.790	0.00	0.00	.883
Age ²	0.0000	0.00	.783	0.00	0.00	.610	0.00	0.00	.010
Sex: female	0.003	0.06	.954	-0.08	0.06	.208	-0.06	0.07	.382
Race-ethnicity: non-Hispanic White	0.03	0.06	.665	-0.01	0.07	.856	0.07	0.07	.329
Adjusted annual income	-0.04	0.03	.140				-0.05	0.04	.247
Years of education	0.00	0.01	.803				0.00	0.01	.967
Work status: other	-0.18	0.13	.172				-0.20	0.14	.160
Work status: retired	-0.35	0.15	.018				-0.16	0.19	.392
Work status: with job	-0.20	0.12	.080				-0.13	0.16	.397
Household size: 2 persons	-0.12	0.10	.195				-0.17	0.10	.096
Household size: 3+ persons	-0.06	0.11	.616				-0.13	0.12	.291
Living without children	-0.02	0.10	.815				0.47	0.37	.200
Marital status: widowed	0.67	0.15	.000				0.73	0.16	.000
Marital status: separated/divorced	0.51	0.09	.000				0.53	0.11	.000
Marital status: never married	0.56	0.09	.000				0.50	0.10	.000
Self-rated health	-0.26	0.04	.000				-0.27	0.05	.000
Religious engagement	0.02	0.01	.268				0.05	0.02	.029
Frequency of spending time with friends	0.00	0.03	.955				0.00	0.03	.892
Frequency of spending time with relatives	-0.08	0.02	.000				-0.09	0.02	.001
Frequency of spending time with neighbors	-0.01	0.02	.353				-0.03	0.02	.159

Deviation from normative adjusted annual income	0.02	0.01	.072	0.00	0.01	.997
Deviation from normative years of education	0.00	0.00	.503	0.00	0.00	.834
Normative work status	-0.09	0.07	.167	-0.10	0.11	.400
Normative household size	-0.06	0.06	.315	-0.01	0.06	.905
Normative children-in-household status	-0.08	0.08	.316	-0.59	0.35	.093
Normative marital status	-0.26	0.07	.000	0.09	0.08	.265
Deviation from normative self-rated health	0.06	0.04	.111	-0.03	0.04	.432
Deviation from normative religious engagement	0.00	0.00	.272	-0.01	0.00	.084
Deviation from normative frequency of spending time with friends	0.01	0.02	.738	0.01	0.02	.760
Deviation from normative frequency of spending time with relatives	0.00	0.01	.966	-0.01	0.01	.186
Deviation from normative frequency of spending time with neighbors	0.00	0.01	.779	0.00	0.01	.591

Notes. Categorical variables were dummy-coded with 0 for male (sex), minority group (race-ethnicity), no job (work status), 1-person household (household size), and married (marital status). Normative categorical variables were dummy-coded with 0 = non-normative status and 1 = normative status. Continuous predictors were centered on the on the grand mean (computed within this wave) prior to these analyses. Normative continuous predictors reflect the squared deviation from the reference value. The outcome variable loneliness was standardized on the grand mean and grand standard deviation.

Table S6. Results for model comparison tests for interactions between different focal predictors and age in predicting loneliness.

Focal predictor	Interaction with age and age ²					Interaction with age group				
	ΔR^2	df_1	df_2	F	p	ΔR^2	df_1	df_2	F	p
Income	0.0003	2	2416	0.40	.700	0.0004	2	2416	0.53	.618
Workstatus	0.0025	6	2412	1.15	.334	0.0006	5	2413	0.32	.899
Household size	0.0037	4	2414	2.63	.035	0.0032	4	2414	2.28	.061
Children living in household	0.0010	2	2416	1.41	.257	0.0009	2	2416	1.25	.300
Marital status	0.0012	6	2412	0.56	.765	0.0008	5	2413	0.47	.802
Self-rated health	0.0005	2	2416	0.67	.564	0.0003	2	2416	0.38	.704
Religious engagement	0.0011	2	2416	1.56	.218	0.0008	2	2416	1.09	.341
Spending time with friends	0.0008	2	2416	1.06	.454	0.0007	2	2416	0.97	.504
Spending time with relatives	0.0007	2	2416	0.95	.447	0.0007	2	2416	0.94	.452
Spending time with neighbors	0.0009	2	2416	1.28	.551	0.0019	2	2416	2.61	.289

Notes. Every interaction between age and a focal predictor was examined in separate model.

Table S7. Interaction with age: Wave 2014.

Focal predictor	Interaction with age and age ²					Interaction with age group				
	DR ²	Df ₁	Df ₂	F	p	DR ²	Df ₁	Df ₂	F	p
Income	0.0011	2	1255	0.81	.571	0.0005	2	1255	0.39	.696
Workstatus	0.0054	6	1251	1.29	.267	0.0029	5	1252	0.82	.536
Household size	0.0080	4	1253	2.88	.024	0.0052	4	1253	1.87	.121
Children living in household	0.0010	2	1255	0.75	.486	0.0005	2	1255	0.34	.713
Marital status	0.0062	6	1251	1.48	.188	0.0023	5	1252	0.66	.657
Self-rated health	0.0022	2	1255	1.58	.262	0.0025	2	1255	1.76	.186
Religious engagement	0.0065	2	1255	4.69	.010	0.0040	2	1255	2.85	.060
Spending time with friends	0.0017	2	1255	1.22	.356	0.0019	2	1255	1.39	.285
Spending time with relatives	0.0008	2	1255	0.54	.642	0.0014	2	1255	0.97	.509
Spending time with neighbors	0.0017	2	1255	1.19	.338	0.0027	2	1255	1.93	.191

Table S8. Interaction with age: Wave 2018.

Focal predictor	Interaction with age and age ²					Interaction with age group				
	DR ²	Df ₁	Df ₂	F	p	DR ²	Df ₁	Df ₂	F	p
Income	0.0002	2	1139	0.11	.895	0.0012	2	1139	0.80	.504
Workstatus	0.0048	6	1135	1.11	.366	0.0038	5	1136	1.06	.394
Household size	0.0009	4	1137	0.32	.860	0.0010	4	1137	0.34	.852
Children living in household	0.0004	2	1139	0.30	.753	0.0016	2	1139	1.10	.346
Marital status	0.0095	6	1135	2.20	.044	0.0020	5	1136	0.56	.732
Self-rated health	0.0035	2	1139	2.43	.103	0.0030	2	1139	2.11	.124
Religious engagement	0.0004	2	1139	0.26	.771	0.0001	2	1139	0.06	.944
Spending time with friends	0.0016	2	1139	1.07	.427	0.0013	2	1139	0.91	.484
Spending time with relatives	0.0012	2	1139	0.85	.478	0.0011	2	1139	0.75	.513
Spending time with neighbors	0.0020	2	1139	1.40	.425	0.0021	2	1139	1.44	.429