

Supplementary

Table S1

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Cohabitation					
	Event sample			Control sample		
	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>
2008	1.52	1.73	200	1.84	1.93	200
2009	1.62	1.83	176	1.82	1.91	177
2010	1.56	1.8	187	1.60	1.82	200
2011	1.53	1.82	174	1.86	1.81	176
2013	1.58	1.81	178	1.55	1.83	180
2014	1.41	1.73	186	1.64	1.73	185
2015	1.7	1.96	184	1.87	1.86	186
2016	1.6	1.92	169	1.84	1.98	176
2017	1.54	1.91	166	1.82	1.93	175

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S2

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Marriage					
	Event sample			Control sample		
	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>
2008	1.35	1.61	368	1.38	1.66	368
2009	1.39	1.73	357	1.63	1.88	353
2010	1.33	1.72	408	1.59	1.84	415
2011	1.43	1.8	395	1.62	1.89	390
2013	1.46	1.84	378	1.42	1.86	385
2014	1.34	1.77	422	1.48	1.82	426
2015	1.48	1.86	400	1.51	1.89	394
2016	1.43	1.86	379	1.54	1.87	376
2017	1.30	1.78	340	1.60	1.87	340

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S3

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Marital separation					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.97	1.90	90	1.92	1.82	90
2009	1.97	1.97	89	1.70	1.91	87
2010	1.87	1.97	95	1.50	1.67	96
2011	2.25	1.96	93	1.59	1.79	93
2013	2.07	2.09	96	1.66	1.76	93
2014	2.17	2.11	93	1.54	1.84	94
2015	2.07	1.96	88	1.68	1.77	90
2016	1.92	2.04	85	1.80	1.8	86
2017	1.96	2.11	76	1.64	1.65	76

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S4

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Transition into parenthood					
	Event sample			Control sample		
	Mean	<i>SD</i>	<i>N</i>	Mean	<i>SD</i>	<i>N</i>
2008	1.15	1.53	364	1.39	1.61	364
2009	1.24	1.67	325	1.52	1.8	321
2010	1.26	1.67	346	1.44	1.75	342
2011	1.37	1.72	330	1.46	1.79	329
2013	1.33	1.67	344	1.59	1.86	343
2014	1.29	1.73	364	1.46	1.74	369
2015	1.49	1.88	348	1.69	1.93	342
2016	1.35	1.81	313	1.51	1.84	324
2017	1.32	1.74	309	1.55	1.88	309

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S5

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Divorce					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.86	1.74	156	2.03	1.85	156
2009	1.94	1.90	144	1.67	1.80	148
2010	1.89	2.00	152	1.72	1.96	159
2011	2.1	1.90	159	1.84	2.06	154
2013	2.29	2.17	163	1.79	1.97	161
2014	2.02	1.97	165	1.95	1.93	161
2015	2.25	2.13	149	1.67	1.92	147
2016	2.00	2.07	142	1.62	1.82	144
2017	1.85	2.08	128	1.42	1.73	128

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S6

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Widowhood					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.86	1.80	116	1.84	1.73	116
2009	2.00	1.89	114	1.64	1.79	113
2010	1.86	1.84	136	1.70	1.78	135
2011	1.98	1.83	135	1.60	1.75	132
2013	1.84	1.92	134	1.65	1.7	138
2014	1.89	1.84	133	1.64	1.73	130
2015	1.89	1.88	124	1.66	1.79	127
2016	2.10	1.93	117	1.65	1.72	118
2017	2.05	1.91	112	1.84	1.67	112

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S7

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Transition into paid employment					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.58	1.75	894	1.70	1.82	894
2009	1.58	1.86	864	1.67	1.85	870
2010	1.68	1.93	942	1.74	1.91	944
2011	1.80	1.99	895	1.73	1.91	896
2013	1.70	1.93	928	1.72	1.89	927
2014	1.66	1.90	1011	1.73	1.88	982
2015	1.67	1.95	981	1.77	1.91	995
2016	1.56	1.89	890	1.79	1.98	897
2017	1.64	2.00	826	1.71	1.92	826

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S8

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Re-employment after unemployment					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.65	1.81	356	1.75	1.87	356
2009	1.63	1.84	344	1.88	1.97	344
2010	1.72	1.97	379	1.77	1.98	388
2011	1.84	1.99	355	1.82	1.95	354
2013	1.85	1.99	381	1.67	1.93	378
2014	1.77	1.95	412	1.71	1.95	398
2015	1.88	2.03	398	1.82	1.96	402
2016	1.87	2.07	360	1.87	2.02	365
2017	1.76	1.99	324	1.85	1.96	324

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S9

Means, standard deviations, and sample size of loneliness in the event and control group in each assessment year

	Job loss					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.69	1.81	550	1.64	1.79	550
2009	1.70	1.86	528	1.52	1.79	524
2010	1.71	1.95	575	1.61	1.78	574
2011	1.89	1.96	552	1.68	1.83	559
2013	1.89	2.02	584	1.52	1.74	578
2014	1.79	1.93	619	1.46	1.75	622
2015	1.93	2.07	594	1.59	1.80	593
2016	1.83	1.99	550	1.41	1.73	552
2017	1.80	2.02	504	1.48	1.86	504

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S10

Means, standard deviations of loneliness, and sample size in the event and control group in each assessment year

	Retirement					
	Event sample			Control sample		
	Mean	SD	N	Mean	SD	N
2008	1.46	1.63	612	1.57	1.73	612
2009	1.43	1.61	610	1.48	1.70	611
2010	1.49	1.65	705	1.67	1.82	702
2011	1.51	1.69	696	1.59	1.78	704
2013	1.45	1.70	727	1.55	1.78	727
2014	1.44	1.63	747	1.51	1.74	745
2015	1.39	1.59	714	1.55	1.82	709
2016	1.37	1.69	686	1.50	1.76	687
2017	1.46	1.67	667	1.56	1.80	667

Note. Data from 2012 had to be excluded because loneliness was measured with a different scale in this year.

Table S11

Percent balance improvement for cohabitation

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	88.47987	95.00527	88.27385	79.87419
Social contact 1	72.17676	0	63.01681	50
Social contact 2	8.546619	0	12.61521	0
Social contact 3	62.19414	0	62.15578	50
Gender	36.48798	0	36.15904	0
Age	93.07656	92.85714	89.47793	72.22222
Education	65.72187	0	15.0981	0
Income	-3947.32	0	-105.401	-100
Total number of participated waves	100	100	100	100
Extraversion	44.65076	40	43.77271	13.33333
Agreeableness	43.24924	-50	-108.221	-336.364
Emotional Stability	-117.619	-66.6667	-73.9167	-50
Openness	50.07658	65	50.9841	73.52941
Conscientiousness	71.81497	40	33.40078	70.83333
Prevalence for transition into paid employment	98.81764	0	98.81827	0
Prevalence for re-employment after unemployment	98.81764	0	98.81827	0
Prevalence for unemployment	90.97468	0	90.81886	0
Prevalence for retirement	98.63191	0	98.62811	0
Loneliness at first wave (T1)	70.37125	0	70.16129	0
First year	100	100	100	100
Last year	100	0	100	100

Table S12

Sample size for propensity-score matched event (treated) and control group (control) for cohabitation

Samples	Control	Treated
All	2308	370
Matched	310	310
Unmatched	1998	60
Discarded	0	0

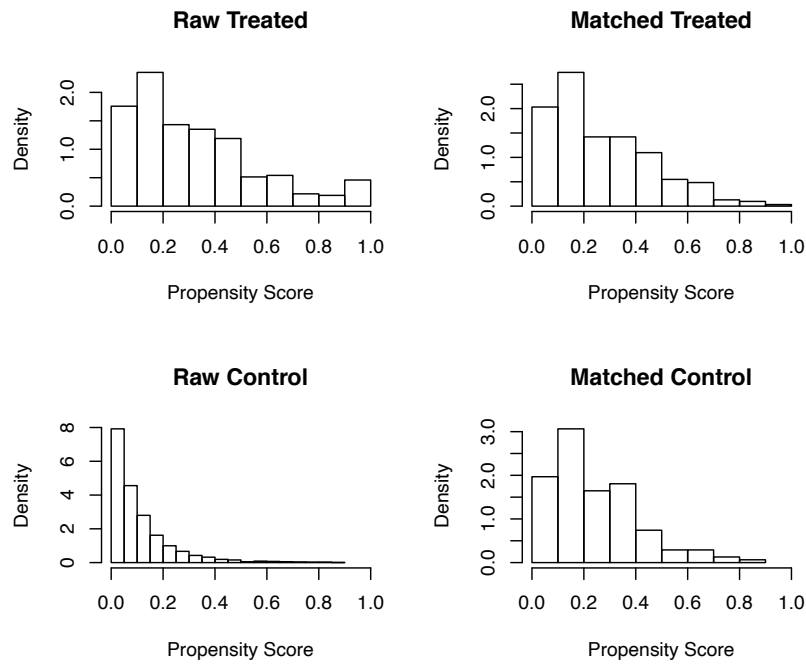


Figure S1. Histograms of propensity score density for raw and treated event and control samples for cohabitation

Table S13

Percent balance improvement for marriage

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	89.53689	90.37266	89.51239	19.97503
Social contact 1	59.44204	0	68.61839	50
Social contact 2	-5.53153	0	31.31865	0
Social contact 3	20.36185	0	65.34883	0
Gender	50.73149	0	51.18416	0
Age	80.34047	40	63.60476	56.25
Education	77.93996	0	54.14199	0
Income	78.21171	100	56.06574	0
Total number of participated waves	100	100	100	100
Extraversion	95.41028	75	69.54549	74.16667
Agreeableness	-9.84367	16.66667	-26.5261	-208.333
Emotional Stability	78.99684	66.66667	54.62283	63.15789
Openness	80.73829	66.66667	53.96668	64.58333
Conscientiousness	75.5273	68.75	61.2449	-40
Prevalence for transition into paid employment	87.54089	0	84.17169	0
Prevalence for re-employment after unemployment	100	0	100	100
Prevalence for unemployment	92.16047	0	92.16082	0

Prevalence for retirement	92.16047	0	92.16082	0
Loneliness at first wave (T1)	92.71931	0	92.58146	0
First year	78.78638	0	78.81471	0
Last year	100	100	100	100

Table S14

Sample size for propensity-score matched event (treated) and control group (control) for marriage

Samples	Control	Treated
All	5051	658
Matched	649	649
Unmatched	4402	9
Discarded	0	0

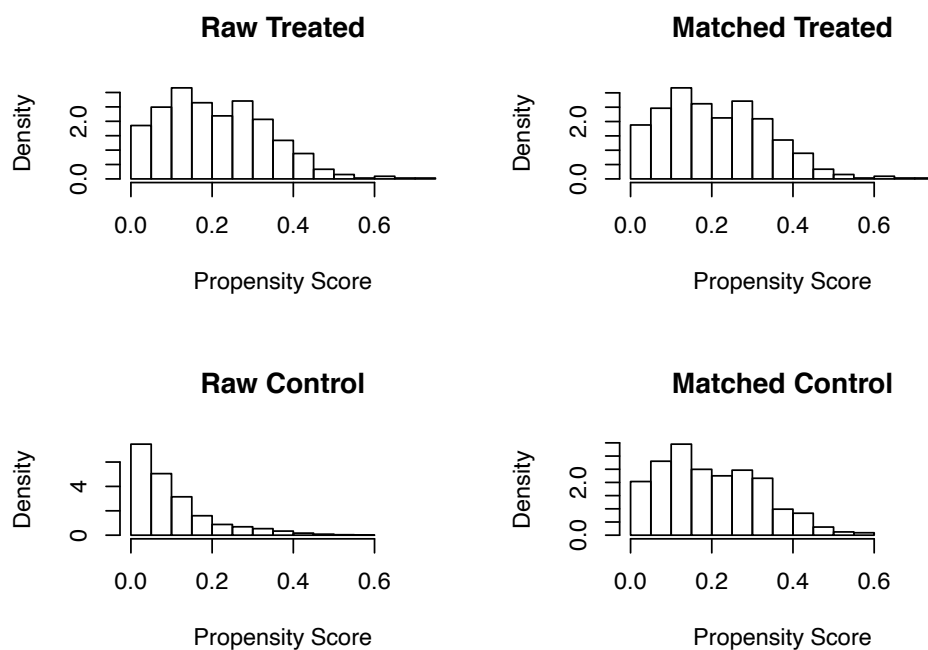


Figure S2. Histograms of propensity score density for raw and treated event and control samples for marriage.

Table S15

Percent balance improvement for transition into parenthood

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	64.57564	64.97551	64.52793	66.50138
Social contact 1	56.29024	0	56.37756	50
Social contact 2	-85.1819	0	-124.802	0
Social contact 3	63.93395	0	44.26021	0
Gender	60.40907	0	60.7068	0
Age	76.98564	88.46154	76.99287	32.5
Education	70.59039	100	68.61873	50
Income	-17.239	0	20.2196	0
Total number of participated waves	100	100	100	100
Extraversion	-96.0426	25	-12.6382	0
Agreeableness	85.01982	62.5	55.74536	-70
Emotional Stability	-546.821	-380	-169.04	33.85417
Openness	60.52599	66.66667	56.03035	35.10638
Conscientiousness	38.23455	37.5	29.67567	-120
Prevalence for transition into paid employment	48.29252	0	48.59676	0
Prevalence for re-employment after unemployment	98.384	0	98.38204	0
Prevalence for unemployment	98.384	0	98.38204	0
Prevalence for retirement	2.031381	0	0.981132	0
Loneliness at first wave (T1)	96.76337	0	96.76409	0
First year	100	0	100	100
Last year	100	0	100	100

Table S16

Sample size for propensity-score matched event (treated) and control group (control) for transition into parenthood

Samples	Control	Treated
All	5623	656
Matched	636	636
Unmatched	4987	20
Discarded	0	0

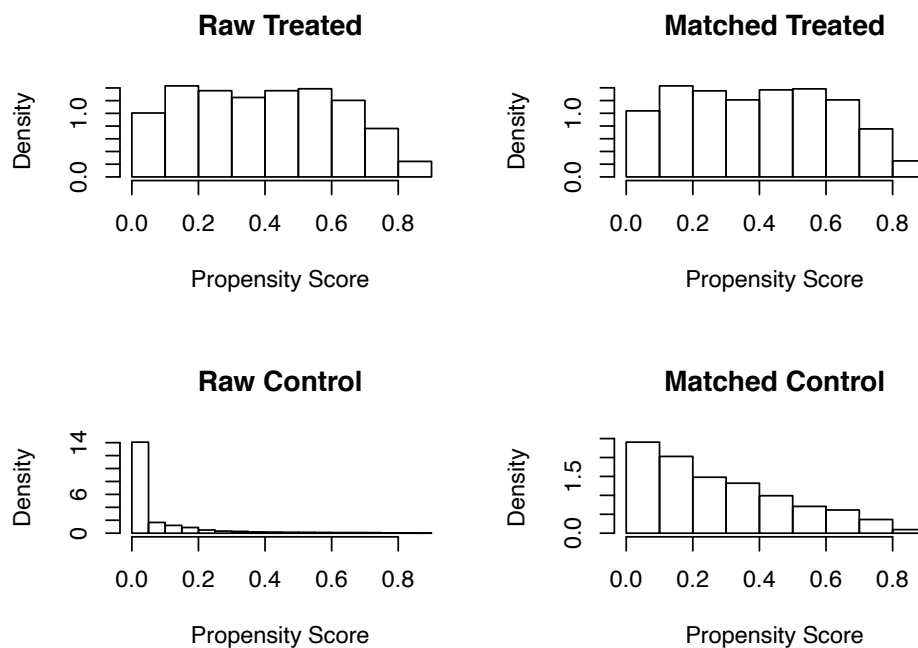


Figure S3. Histograms of propensity score density for raw and treated event and control samples for transition into parenthood.

Table S17

Percent balance improvement for marital separation

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	94.67359	97.95284	93.37843	-30.886
Social contact 1	-558.001	0	-403.817	0
Social contact 2	-16.6355	0	-32.2519	0
Social contact 3	95.00454	0	58.70354	50
Gender	-17967	0	0	0
Age	59.09568	40	38.32229	25
Education	7.377425	0	45.88634	50
Income	74.9044	0	40.93182	33.33333
Total number of participated waves	100	100	100	100
Extraversion	79.88111	16.66667	3.460255	33.33333
Agreeableness	80.76409	-25	-13.1921	34.54545
Emotional Stability	87.56888	25	20.03464	44
Openness	76.48669	80	67.47471	85.41667
Conscientiousness	-104.331	0	-31.3662	68.62745
Prevalence for transition into paid employment	100	0	100	100
Prevalence for re-employment after unemployment	83.41949	100	77.09924	0
Prevalence for unemployment	95.88959	0	95.96947	0
Prevalence for retirement	95.88959	0	95.96947	0
Loneliness at first wave (T1)	32.04174	0	26.71756	0
First year	61.48973	0	63.35878	0
Last year	100	0	100	100

Table S18

Sample size for propensity-score matched event (treated) and control group (control) for marital separation

Samples	Control	Treated
All	11027	132
Matched	131	131
Unmatched	10896	1
Discarded	0	0

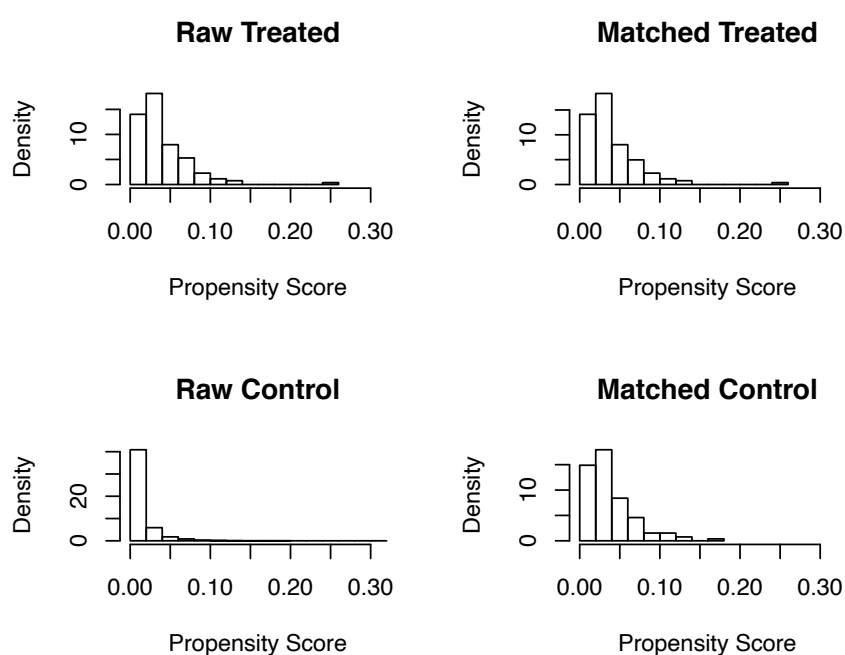


Figure S4. Histograms of propensity score density for raw and treated event and control samples for marital separation.

Table S19

Percent balance improvement for divorce

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	91.69002	97.94991	90.96781	42.44232
Social contact 1	74.6066	0	-37.5483	0
Social contact 2	57.51043	0	63.80309	0
Social contact 3	60.16392	0	31.34263	50
Gender	20.95673	0	15.54054	0
Age	-33.8912	66.66667	62.95036	63.63636
Education	42.34101	0	60.22922	50
Income	47.72238	0	37.99682	0
Total number of participated waves	100	100	100	100
Extraversion	82.23791	33.33333	26.03862	33.33333
Agreeableness	58.10207	33.33333	8.433271	12.12121
Emotional Stability	80.42526	18.33333	25.0638	33.33333
Openness	66.84833	70	61.73804	70
Conscientiousness	-610.85	-100	-37.6862	71.42857
Prevalence for transition into paid employment	100	0	100	100
Prevalence for re-employment after unemployment	93.57324	100	78.91892	0
Prevalence for unemployment	89.75617	0	89.86486	0
Prevalence for retirement	89.75617	0	89.86486	0
Loneliness at first wave (T1)	69.10087	0	68.54613	0
First year	74.32655	0	74.66216	0
Last year	100	0	100	100

Table S20

Sample size for propensity-score matched event (treated) and control group (control) for divorce

Samples	Control	Treated
All	10026	225
Matched	222	222
Unmatched	9804	3
Discarded	0	0

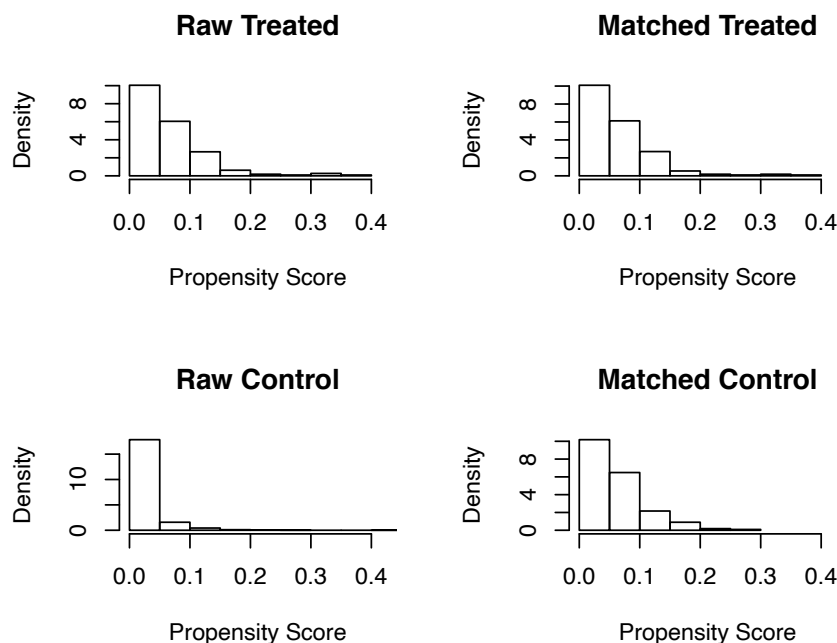


Figure S5. Histograms of propensity score density for raw and treated event and control samples for divorce.

Table S21

Percent balance improvement for widowhood

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	91.30345	95.84435	91.03328	61.74766
Social contact 1	0.396975	0	-2.7027	0
Social contact 2	55.1669	0	47.05882	0
Social contact 3	100	100	66.99029	50
Gender	38.50104	0	38.46154	0
Age	99.03398	95.45455	94.24242	79.41176
Education	78.47799	0	71.92982	0
Income	-219.184	0	15.94203	-100
Total number of participated waves	100	100	100	100
Extraversion	80.31934	37.5	30.69496	60.46512
Agreeableness	66.58526	25	48.72953	-23.8095
Emotional Stability	80.39944	44.94382	35.10879	60
Openness	94.86008	67.5	63.31164	54.16667
Conscientiousness	83.89892	36.11111	31.76612	51.08696
Prevalence for transition into paid employment	100	0	100	100
Prevalence for re-employment after unemployment	82.2098	0	61.53846	0
Prevalence for unemployment	96.96693	0	96.9697	0
Prevalence for retirement	96.96693	0	96.9697	0
Loneliness at first wave (T1)	95.18495	100	95.18072	0
First year	100	0	100	100
Last year	100	100	100	100

Table S22

Sample size for propensity-score matched event (treated) and control group (control) for widowhood

Samples	Control	Treated
All	10538	164
Matched	164	164
Unmatched	10374	0
Discarded	0	0

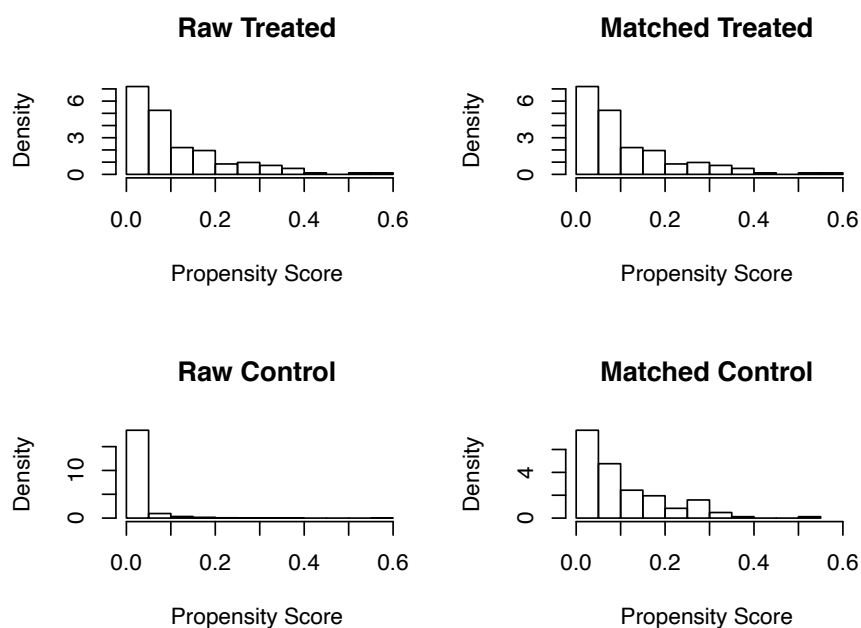


Figure S6. Histograms of propensity score density for raw and treated event and control samples for widowhood.

Table S23

Percent balance improvement for transition into paid employment

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	52.49219	55.20985	52.49042	40.51961
Social contact 1	32.38289	0	24.4365	0
Social contact 2	26.31513	0	26.00585	0
Social contact 3	33.82147	0	33.79937	50
Gender	-68.6551	0	-68.2997	0
Age	53.74123	50	52.30514	46.66667
Education	57.30431	0	37.11609	0
Income	18.30522	0	-13.8612	-25
Total number of participated waves	100	100	100	100
Extraversion	29.06164	33.33333	27.23039	0
Agreeableness	-449.875	0	-27.1266	17.94872
Emotional Stability	71.15503	70	64.38088	40
Openness	58.89507	60	58.99574	80.85106
Conscientiousness	93.79286	70	61.75057	-18.1818
Prevalence for transition into paid employment	36.03845	0	35.95399	0
Prevalence for re-employment after unemployment	74.04855	0	74.16703	0
Prevalence for unemployment	71.56054	0	71.48806	0
Prevalence for retirement	-559.555	0	-510.97	0
Loneliness at first wave (T1)	89.72682	0	89.70826	0
First year	-521.219	0	-20.8194	0
Last year	100	0	100	100

Table S24

Sample size for propensity-score matched event (treated) and control group (control) for transition into paid employment

Samples	Control	Treated
All	4604	1746
Matched	1633	1633
Unmatched	2971	113
Discarded	0	0

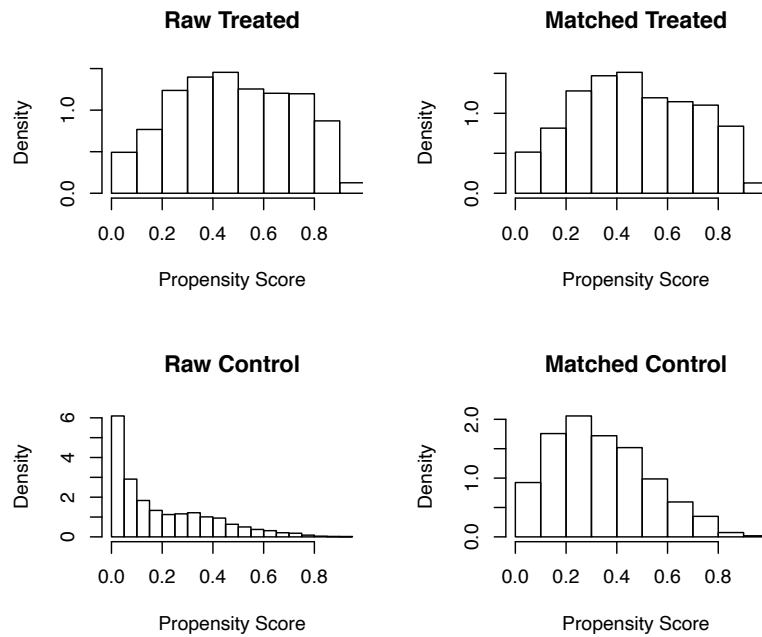


Figure S7. Histograms of propensity score density for raw and treated event and control samples for transition into paid employment.

Table S25

Percent balance improvement for re-employment after unemployment

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	79.00192	89.62622	78.93121	60.05849
Social contact 1	-32.1145	0	-29.8816	50
Social contact 2	-106.137	0	-76.6792	0
Social contact 3	53.00934	0	16.36058	0
Gender	41.29068	0	39.48442	0
Age	86.12093	70	59.06708	51.51515
Education	70.12455	100	20.45343	0
Income	86.13462	0	-71.9033	-50
Total number of participated waves	100	100	100	100
Extraversion	99.70249	33.33333	20.9198	-146.667
Agreeableness	-706.473	0	-45.8393	20.33898
Emotional Stability	83.58966	50	36.94952	22.22222
Openness	97.55704	80	75.41984	78.7234
Conscientiousness	34.50563	0	-42.9026	6.666667
Prevalence for transition into paid employment	18.604	0	17.69882	0
Prevalence for re-employment after unemployment	94.56632	0	94.58545	0
Prevalence for unemployment	67.83625	0	65.70784	0
Prevalence for retirement	76.50287	0	76.48538	0
Loneliness at first wave (T1)	96.87764	0	96.88253	0
First year	54.45832	0	47.33704	0
Last year	100	0	100	100

Table S26

Sample size for propensity-score matched event (treated) and control group (control) for re-employment after unemployment

Samples	Control	Treated
All	4604	608
Matched	591	591
Unmatched	4013	17
Discarded	0	0

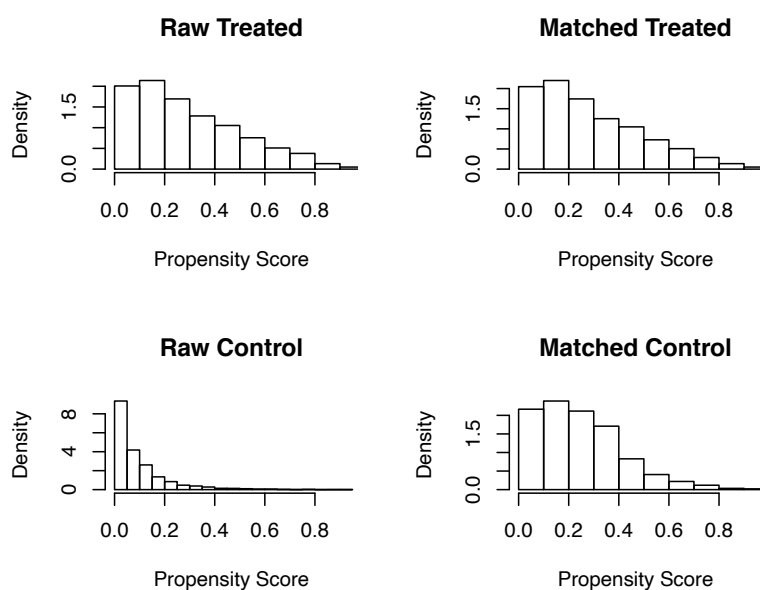


Figure S8. Histograms of propensity score density for raw and treated event and control samples for re-employment after unemployment.

Table S27

Percent balance improvement for job loss

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	95.68289	97.37708	95.62508	67.95675
Social contact 1	-413.235	0	-103.684	0
Social contact 2	70.96823	0	60.69118	0
Social contact 3	-1104.41	0	-88.9847	0
Gender	11.69594	0	13.60698	0
Age	87.98487	80	73.32961	57.14286
Education	56.24876	0	67.43648	0
Income	-2.9452	0	57.7804	0
Total number of participated waves	100	100	100	100
Extraversion	59.51372	50	17.71214	66.66667
Agreeableness	97.4063	33.33333	21.99766	6.666667
Emotional Stability	72.7471	63.63636	59.00796	16.92308
Openness	82.51045	66.66667	58.14514	34.21053
Conscientiousness	96.3278	60	50.73581	6.666667
Prevalence for transition into paid employment	41.07968	0	40.44118	0
Prevalence for re-employment after unemployment	-258.65	0	-235.973	0
Prevalence for unemployment	100	0	100	100
Prevalence for retirement	90.43218	0	90.40078	0
Loneliness at first wave (T1)	88.1372	0	88.28002	0
First year	100	0	100	100
Last year	47.97632	0	47.62345	0

Table S28

Sample size for propensity-score matched event (treated) and control group (control) for job loss

Samples	Control	Treated
All	10159	891
Matched	884	884
Unmatched	9275	7
Discarded	0	0

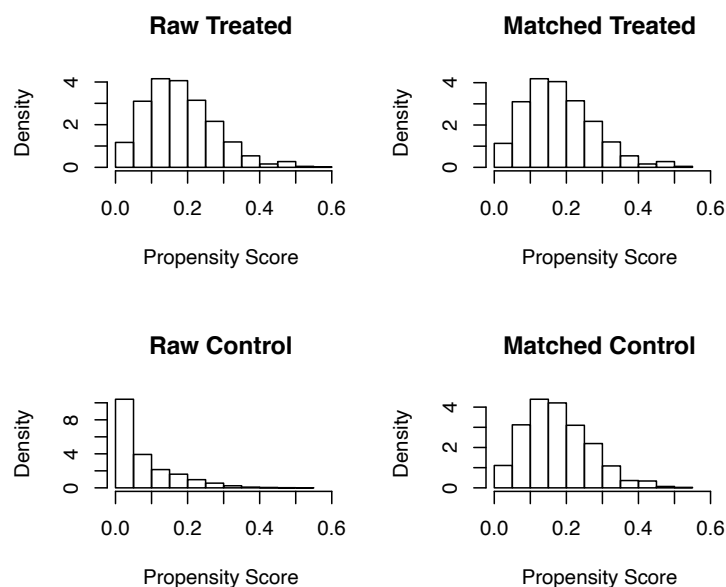


Figure S9. Histograms of propensity score density for raw and treated event and control samples for job loss.

Table S29

Percent balance improvement for retirement

Variables	Mean Diff.	eQQ Med	eQQ Mean	eQQ Max
Distance	51.26725	48.55705	51.22954	52.55078
Social contact 1	41.97553	0	33.18649	0
Social contact 2	96.84605	0	84.82379	0
Social contact 3	94.69008	0	85.54515	0
Gender	40.3292	0	39.86784	0
Age	76.98723	73.91304	76.94806	25.64103
Education	95.37475	0	81.40243	50
Income	57.62117	100	52.50492	0
Total number of participated waves	100	100	100	100
Extraversion	72.729	66.66667	70.45414	45.83333
Agreeableness	76.95932	50	62.19838	81.06061
Emotional Stability	70.42469	60	53.31848	0
Openness	43.5663	40	43.12409	53.22581
Conscientiousness	86.79013	68.75	73.86861	59.02778
Prevalence for transition into paid employment	93.75563	0	93.77514	0
Prevalence for re-employment after unemployment	56.66557	0	56.62108	0
Prevalence for unemployment	100	0	0	0
Prevalence for retirement	78.94483	0	78.74116	0
Loneliness at first wave (T1)	50.56992	0	50.38601	0
First year	100	0	100	100
Last year	-312.256	0	-27.2026	0

Table S30

Sample size for propensity-score matched event (treated) and control group (control) for retirement

Samples	Control	Treated
All	8795	910
Matched	908	908
Unmatched	7887	2
Discarded	0	0

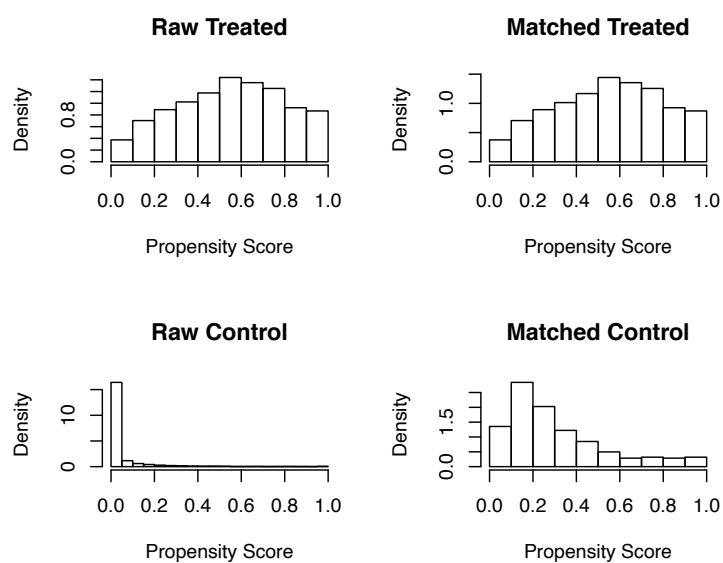


Figure S10. Histograms of propensity score density for raw and treated event and control samples for retirement.

Model equations

Below, we present a model equation for Level 1 and Level 2 (and the total equation) for the most complex model (Model B). Model B was estimated for divorce and job loss. For all other major life events, Model A was estimated which does not include the non-linear time variables (preLin^2 and postLin^2). Moreover, the model equations below do not include random slopes. Because it was computationally impossible to model all random effects simultaneously, we extended the model equation below by adding one random effect for one Level 1 predictor at a time (e.g., only a random slope of preLin) and compared this model to the model without any random effect using a χ^2 deviance test (for a similar procedure see Denissen et al., 2018).

$$\text{Level 1: Loneliness}_{ti} = \pi_{0i} + \pi_{1i} \text{preLin}_{ti} + \pi_{2i} \text{postLin}_{ti} + \pi_{3i} \text{postD}_{ti} + \pi_{4i} \text{firstYear}_{ti} + \pi_{5i} \text{testing}_{ti} + \pi_{6i} \text{preLin}_{ti}^2 + \pi_{7i} \text{postLin}_{ti}^2 + \mathbf{e}_{ti}$$

$$\text{Level 2: } \pi_{0i} = \beta_{00} + \beta_{01} \text{group}_i + \beta_{02} \text{sex}_i + \beta_{03} \text{age at event}_i + \beta_{04} \text{age at event}_i^2 + \mathbf{r}_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11} \text{group}_i$$

$$\pi_{2i} = \beta_{20} + \beta_{21} \text{group}_i$$

$$\pi_{3i} = \beta_{30} + \beta_{31} \text{group}_i$$

$$\pi_{4i} = \beta_{40} + \beta_{41} \text{group}_i$$

$$\pi_{5i} = \beta_{50}$$

$$\pi_{6i} = \beta_{60} + \beta_{61} \text{group}_i$$

$$\pi_{7i} = \beta_{70} + \beta_{71} \text{group}_i$$

Total equation:

$$\begin{aligned} \text{Loneliness}_{ti} = & \beta_{00} + \beta_{01} \text{group}_i + \beta_{02} \text{sex}_i + \beta_{03} \text{age at event}_i + \beta_{04} \text{age at event}_i^2 + \\ & \beta_{10} \text{preLin}_{ti} + \beta_{11} \text{group}_i \text{preLin}_{ti} + \beta_{20} \text{postLin}_{ti} + \beta_{21} \text{group}_i \text{postLin}_{ti} + \beta_{30} \text{postD}_{ti} + \\ & \beta_{31} \text{group}_i \text{postD}_{ti} + \beta_{40} \text{firstYear}_{ti} + \beta_{41} \text{group}_i \text{firstYear}_{ti} + \beta_{50} \text{testing}_{ti} + \\ & \beta_{60} \text{preLin}_{ti}^2 + \beta_{61} \text{group}_i \text{preLin}_{ti}^2 + \beta_{70} \text{postLin}_{ti}^2 + \beta_{71} \text{group}_i \text{postLin}_{ti}^2 + \mathbf{r}_{0i} + \mathbf{e}_{ti} \end{aligned}$$

Table S31

Descriptive statistics of the sample that experienced an event prior to the study (Group A) compared to the event group that experienced the event during the study (Group B)

Event	Group	Age	Sex	Loneliness	Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Openness
Cohabitation	A	$M = 43.56$ $SD = 16.74$	Men: 47 % Women: 53 %	$M = 1.49$ $SD = 1.70$	$M = 32.83$ $SD = 6.10$	$M = 38.68$ $SD = 4.69$	$M = 36.91$ $SD = 4.97$	$M = 34.26$ $SD = 6.31$	$M = 34.85$ $SD = 4.63$
	B	$M = 39.33$ $SD = 13.45$	Men: 57 % Women: 43 %	$M = 1.67$ $SD = 1.84$	$M = 34.00$ $SD = 6.38$	$M = 38.66$ $SD = 4.88$	$M = 36.91$ $SD = 5.11$	$M = 34.71$ $SD = 6.82$	$M = 36.56$ $SD = 4.70$
Marriage	A	$M = 50.97$ $SD = 13.28$	Men: 47 % Women: 53 %	$M = 1.45$ $SD = 1.65$	$M = 32.71$ $SD = 5.93$	$M = 38.93$ $SD = 4.80$	$M = 37.72$ $SD = 4.57$	$M = 34.72$ $SD = 6.22$	$M = 34.52$ $SD = 4.62$
	B	$M = 33.32$ $SD = 12.81$	Men: 48 % Women: 52 %	$M = 1.43$ $SD = 1.68$	$M = 33.49$ $SD = 6.28$	$M = 38.79$ $SD = 4.54$	$M = 36.69$ $SD = 4.92$	$M = 34.10$ $SD = 6.35$	$M = 36.13$ $SD = 4.42$
Transition into parenthood	A	$M = 42.53$ $SD = 11.33$	Men: 67 % Women: 33 %	$M = 1.62$ $SD = 1.79$	$M = 33.09$ $SD = 6.15$	$M = 38.11$ $SD = 4.79$	$M = 36.73$ $SD = 4.89$	$M = 34.84$ $SD = 6.35$	$M = 35.68$ $SD = 4.70$
	B	$M = 30.56$ $SD = 5.65$	Men: 44 % Women: 56 %	$M = 1.23$ $SD = 1.59$	$M = 32.71$ $SD = 6.48$	$M = 38.24$ $SD = 4.53$	$M = 36.74$ $SD = 4.95$	$M = 34.57$ $SD = 6.16$	$M = 35.87$ $SD = 4.53$
Marital separation	A	$M = 50.84$ $SD = 12.35$	Men: 35 % Women: 65 %	$M = 2.49$ $SD = 1.97$	$M = 31.16$ $SD = 5.58$	$M = 39.44$ $SD = 5.34$	$M = 36.65$ $SD = 4.93$	$M = 34.59$ $SD = 6.51$	$M = 35.19$ $SD = 4.53$
	B	$M = 45.62$ $SD = 12.86$	Men: 46 % Women: 54 %	$M = 2.11$ $SD = 1.96$	$M = 32.43$ $SD = 6.00$	$M = 39.05$ $SD = 4.72$	$M = 37.24$ $SD = 5.06$	$M = 33.43$ $SD = 6.26$	$M = 36.13$ $SD = 4.61$
Divorce	A	$M = 53.00$ $SD = 11.40$	Men: 41 % Women: 59 %	$M = 2.15$ $SD = 1.94$	$M = 32.73$ $SD = 5.98$	$M = 39.48$ $SD = 4.58$	$M = 37.38$ $SD = 4.83$	$M = 34.44$ $SD = 6.47$	$M = 35.38$ $SD = 4.57$
	B	$M = 42.86$ $SD = 12.50$	Men: 43 % Women: 57 %	$M = 2.10$ $SD = 1.89$	$M = 32.36$ $SD = 5.87$	$M = 39.13$ $SD = 4.66$	$M = 36.92$ $SD = 4.79$	$M = 33.22$ $SD = 6.41$	$M = 35.90$ $SD = 4.50$
Widowhood	A	$M = 69.47$ $SD = 10.94$	Men: 30 % Women: 70 %	$M = 1.96$ $SD = 1.81$	$M = 32.01$ $SD = 5.87$	$M = 39.32$ $SD = 4.28$	$M = 37.61$ $SD = 5.01$	$M = 34.99$ $SD = 6.29$	$M = 33.56$ $SD = 4.66$
	B	$M = 64.85$ $SD = 10.33$	Men: 38 % Women: 61 %	$M = 1.82$ $SD = 1.77$	$M = 32.56$ $SD = 5.48$	$M = 39.61$ $SD = 4.12$	$M = 37.79$ $SD = 3.86$	$M = 34.34$ $SD = 5.73$	$M = 34.05$ $SD = 4.50$

Event	Group	Age	Sex	Loneliness	Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Openness
Transition into paid employment	A	$M = 41.97$ $SD = 11.16$	Men: 50 % Women: 50 %	$M = 1.47$ $SD = 1.69$	$M = 32.90$ $SD = 6.22$	$M = 38.63$ $SD = 4.74$	$M = 37.37$ $SD = 4.79$	$M = 34.79$ $SD = 6.22$	$M = 35.35$ $SD = 4.54$
	B	$M = 32.00$ $SD = 13.20$	Men: 40 % Women: 60 %	$M = 1.74$ $SD = 1.86$	$M = 33.27$ $SD = 6.34$	$M = 38.91$ $SD = 4.50$	$M = 36.07$ $SD = 5.06$	$M = 33.09$ $SD = 6.40$	$M = 35.71$ $SD = 4.53$
Re-employment after unemployment	A	$M = 39.50$ $SD = 12.62$	Men: 48 % Women: 52 %	$M = 1.51$ $SD = 1.72$	$M = 33.00$ $SD = 6.24$	$M = 38.66$ $SD = 4.69$	$M = 37.05$ $SD = 4.89$	$M = 34.46$ $SD = 6.30$	$M = 35.41$ $SD = 4.54$
	B	$M = 37.96$ $SD = 11.36$	Men: 46 % Women: 54 %	$M = 1.83$ $SD = 1.92$	$M = 32.90$ $SD = 6.21$	$M = 38.91$ $SD = 4.61$	$M = 36.43$ $SD = 5.01$	$M = 33.35$ $SD = 6.30$	$M = 35.62$ $SD = 4.52$
Job loss	A	$M = 44.78$ $SD = 11.91$	Men: 57 % Women: 43 %	$M = 2.28$ $SD = 2.04$	$M = 31.95$ $SD = 6.29$	$M = 38.13$ $SD = 5.55$	$M = 35.89$ $SD = 5.42$	$M = 33.07$ $SD = 6.60$	$M = 34.89$ $SD = 4.89$
	B	$M = 39.44$ $SD = 11.96$	Men: 45 % Women: 55 %	$M = 1.83$ $SD = 1.90$	$M = 33.06$ $SD = 6.22$	$M = 39.03$ $SD = 4.42$	$M = 36.61$ $SD = 5.05$	$M = 33.23$ $SD = 6.51$	$M = 35.66$ $SD = 4.69$
Retirement	A	$M = 69.89$ $SD = 6.62$	Men: 58 % Women: 42 %	$M = 1.69$ $SD = 1.68$	$M = 32.35$ $SD = 5.59$	$M = 38.77$ $SD = 4.23$	$M = 37.88$ $SD = 4.54$	$M = 35.39$ $SD = 6.01$	$M = 33.79$ $SD = 4.52$
	B	$M = 61.41$ $SD = 6.32$	Men: 47 % Women: 53 %	$M = 1.56$ $SD = 1.67$	$M = 32.14$ $SD = 5.82$	$M = 39.33$ $SD = 4.15$	$M = 37.64$ $SD = 4.57$	$M = 35.33$ $SD = 5.73$	$M = 34.54$ $SD = 4.55$

Notes. Age, and loneliness values refer to the first participated wave of each participant. The Big Five personality traits refer to aggregated scores across all participated waves (theoretical range of scale scores: 10-50).

In addition to the linear mixed effect models reported in the main manuscript, we modeled the average trajectory of loneliness using generalized additive models (GAMM; Wood, 2006, 2011) using the *gam* function in the R package *mgcv* Version 1.8-26 (Wood, 2017). In GAMMs, the form and smoothness of the trajectory is estimated in a data-driven manner instead of being user-specified (as when selecting a linear or quadratic fit in regression). GAMMs use a fitting technique that penalizes less smooth models and selects optimal smoothness by penalizing likelihood metrics that approximate out-of-sample predictive fit (Doré & Bolger, 2017; Wood, 2006). The outcome variable (loneliness) thus varied as an unknown smooth function of a predictor variable (year relative to event occurrence), which is represented using regression splines (i.e., piecewise polynomial fits connected by so called knots). Additionally, the GAMM intercept, linear slope, and nonlinear curve coefficients can be estimated as varying from one person to another (for a similar procedure see (Doré & Bolger, 2017). For each of the nine major life events, we fitted three different GAMM models (cf. Doré & Bolger, 2017): (1) fixed effect of time, without any person-specific model parameters (i.e., an identical curve is assigned to each person), (2) multilevel model with person-specific varying intercepts (i.e., the same shape of curve is assigned to each person, but an intercept allows individual differences in the overall level of the loneliness curve), and (3) multilevel model with person-specific varying intercepts and slopes (i.e., additionally to the intercept, a slope parameter allows for different linear change in loneliness over time). For model estimation, restricted maximum likelihood (REML) was used. We set the maximum number of knots (i.e., minimum possible smoothness) to 9 so that model simplicity is balanced against explanatory power (Wood, 2018).

Models with varying intercept and varying slope had the best model fit for all major life events (Table S32). The average trajectories of loneliness estimated with GAMM are

displayed in Figures S11-S15. The plots mirror the plots of the model-estimated loneliness trajectories using mixed effect models that are reported in the main manuscript.

Table S32

Sample Size, Effective Degrees of Freedom, F Score for the Smooth Effect of Year, Pseudo- R^2 , Optimized REML Selection Criterion, and AIC for (1) Fixed Effect-Only Models, (2) Varying Intercept Models, and (3) Varying Intercept, Varying Slope Models of Trajectories in Loneliness Surrounding Major Life Events.

Major life event	Sample	Effective df	F (year)	Pseudo- R^2	REML	AIC
Cohabitation	Event sample ($n = 1,620$)					
	Fixed effect only	1.00	0.32***	0.0	3,282	6,560
	Varying intercept	1.00	7.25**	62.7	2,911	5,469
	Varying intercept and varying slope	1.01	4.35*	69.0	2,889	5,339
	Control sample ($n = 1,655$)					
	Fixed effect only	1.01	1.81	0.1	3,385	6,767
	Varying intercept	2.05	1.20	64.8	2,975	5,563
	Varying intercept and varying slope	2.07	0.88	70.8	2,949	5,430
Marriage	Event sample ($n = 3,447$)					
	Fixed effect only	2.01	2.12	0.2	6,872	13,741
	Varying intercept	2.83	3.02*	62.1	6,104	11,474
	Varying intercept and varying slope	2.75	1.76	69.2	6,047	11,147
	Control sample ($n = 3,447$)					
	Fixed effect only	1.85	1.45	0.1	7,005	14,007
	Varying intercept	2.70	3.47*	65.3	6,121	11,449
	Varying intercept and varying slope	2.34	2.57	69.8	6,097	11,265
Transition into parenthood	Event sample ($n = 3,043$)					
	Fixed effect only	2.60	6.45***	0.8	5,954	11,903
	Varying intercept	4.24	5.36***	61.0	5,346	10,061
	Varying intercept and varying slope	4.26	3.78**	69.0	5,284	9,732
	Control sample ($n = 3,043$)					
	Fixed effect only	1.01	7.23**	0.2	6,107	12,209
	Varying intercept	3.18	3.28*	65.9	5,374	9,999
	Varying intercept and varying slope	3.25	2.44*	69.9	5,355	9,862

Major life event	Sample	Effective <i>df</i>	F (year)	Pseudo- <i>R</i> ²	REML	AIC
Marital separation	Event sample (<i>n</i> = 805)					
	Fixed effect only	3.37	4.03**	2.5	1,699	3,397
	Varying intercept	3.45	4.30**	66.6	1,475	2,762
	Varying intercept and varying slope	3.67	2.87*	73.6	1,461	2,674
	Control sample (<i>n</i> = 805)					
	Fixed effect only	1.00	0.26	0.0	1,608	3,215
	Varying intercept	2.82	2.15	62.4	1,420	2,661
	Varying intercept and varying slope	3.25	2.59*	69.2	1,408	2,588
Divorce	Event sample (<i>n</i> = 1,358)					
	Fixed effect only	3.25	4.36**	1.5	2,864	5,724
	Varying intercept	4.68	3.63**	62.7	2,541	4,788
	Varying intercept and varying slope	4.91	2.69*	70.1	2,518	4,652
	Control sample (<i>n</i> = 1,358)					
	Fixed effect only	2.64	3.17*	0.9	2,801	5,599
	Varying intercept	3.98	4.12**	62.0	2,485	4,678
	Varying intercept and varying slope	3.72	2.81*	68.3	2,469	4,576
Widowhood	Event sample (<i>n</i> = 1,121)					
	Fixed effect only	3.69	1.47	0.9	2,293	4,582
	Varying intercept	5.85	3.65***	62.9	2,009	3,775
	Varying intercept and varying slope	6.09	4.06***	72.3	1,971	3,604
	Control sample (<i>n</i> = 1,121)					
	Fixed effect only	1.00	0.93	0.1	2,212	4,423
	Varying intercept	2.24	0.90	67.9	1,859	3,451
	Varying intercept and varying slope	1.00	0.02	74.0	1,839	3,341
Transition into paid employment	Event sample (<i>n</i> = 8,231)					
	Fixed effect only	1.00	0.47	0.0	17,023	34,040
	Varying intercept	1.30	4.43*	64.0	15,107	28,322
	Varying intercept and varying slope	1.00	2.97	70.2	14,992	27,626
	Control sample (<i>n</i> = 8,231)					
	Fixed effect only	1.01	5.08*	0.1	16,955	33,905
	Varying intercept	1.02	4.10*	67.9	14,706	27,314
	Varying intercept and varying slope	1.00	2.57	73.4	14,601	26,632

Major life event	Sample	Effective <i>df</i>	F (year)	Pseudo- <i>R</i> ²	REML	AIC
Re-employment after unemployment	Event sample (<i>n</i> = 3,309)					
	Fixed effect only	2.31	5.85***	0.5	6,927	13,850
	Varying intercept	1.01	1.24	63.9	6,124	11,491
	Varying intercept and varying slope	1.00	0.29	70.6	6,073	11,193
	Control sample (<i>n</i> = 3,309)					
	Fixed effect only	3.18	8.32***	1.1	6,900	13,795
	Varying intercept	2.14	0.58	68.4	5,932	11,046
	Varying intercept and varying slope	1.01	0.47	73.7	5,885	10,777
Job loss	Event sample (<i>n</i> = 5,056)					
	Fixed effect only	2.74	10.68***	0.8	10,563	21,121
	Varying intercept	3.35	1.88	64.7	9,293	17,418
	Varying intercept and varying slope	3.67	2.37	70.5	9,231	17,030
	Control sample (<i>n</i> = 5,056)					
	Fixed effect only	3.20	3.42**	0.3	10,107	20,209
	Varying intercept	2.62	3.11*	64.9	8,808	16,444
	Varying intercept and varying slope	1.02	2.72	71.6	8,731	15,964
Retirement	Event sample (<i>n</i> = 6,164)					
	Fixed effect only	1.00	0.02	0.0	11,848	23,690
	Varying intercept	3.37	3.69**	66.6	9,992	18,558
	Varying intercept and varying slope	3.10	2.57*	71.7	9,920	18,147
	Control sample (<i>n</i> = 6,164)					
	Fixed effect only	1.45	0.79	0.0	12,276	24,546
	Varying intercept	1.01	1.72	67.1	10,376	19,321
	Varying intercept and varying slope	1.02	1.28	73.8	10,249	18,665

Note. The maximum number of knots was set to $k = 9$; n = number of observations; Pseudo- R^2 indicates proportion of deviance explained by the model; Lower REML/AIC scores indicate better predictive fit; REML = restricted maximum likelihood; AIC = Akaike information criterion. *** $p < .001$, ** $p < .01$, * $p < .05$.

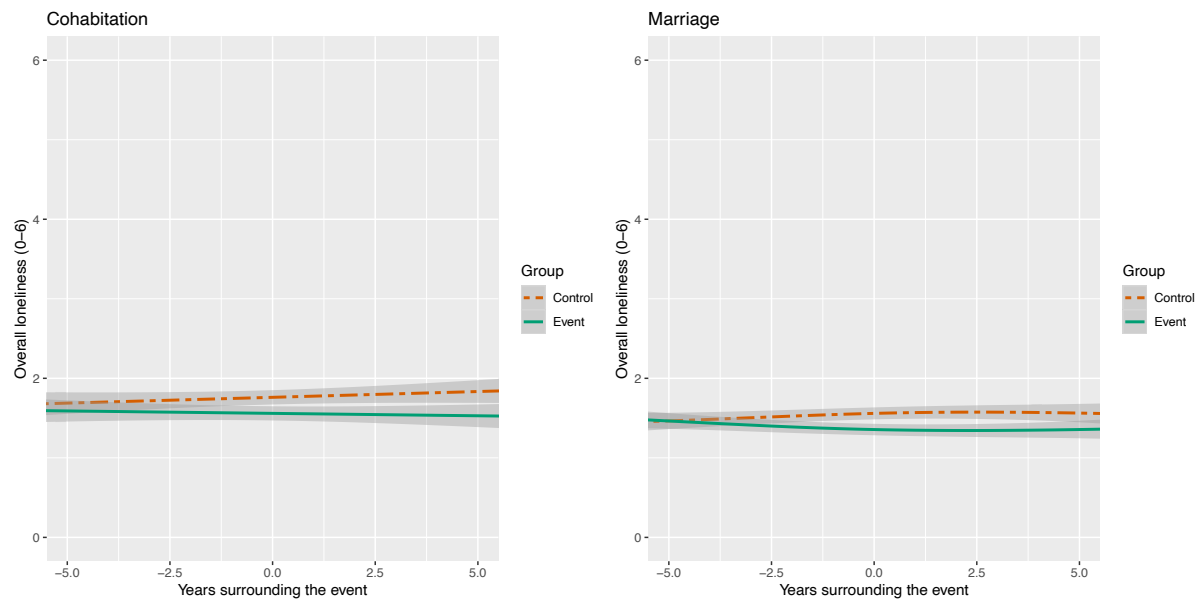


Figure S11. GAMM-estimated average trajectories of loneliness surrounding cohabitation and marriage.

The green (solid) line represents the event group, the red (dashed) line represents the control group. Event and control group were propensity score matched using 1:1 nearest neighbor matching.

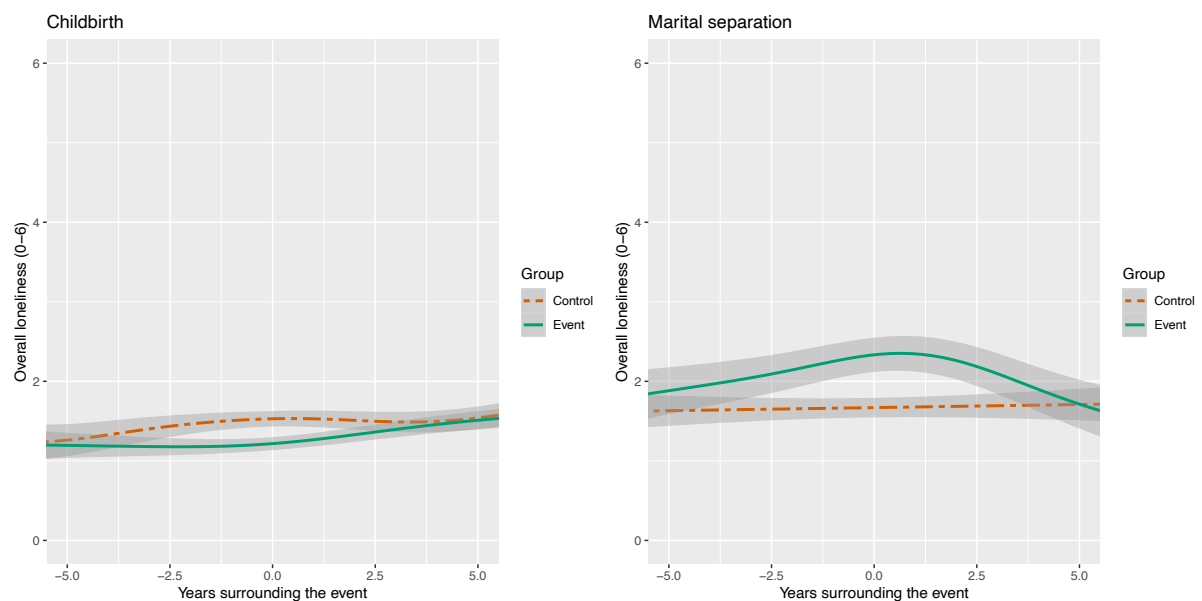


Figure S12. GAMM-estimated average trajectories of loneliness surrounding transition into parenthood and marital separation. The green (solid) line represents the event group, the red (dashed) line represents the control group. Event and control group were propensity score matched using 1:1 nearest neighbor matching.

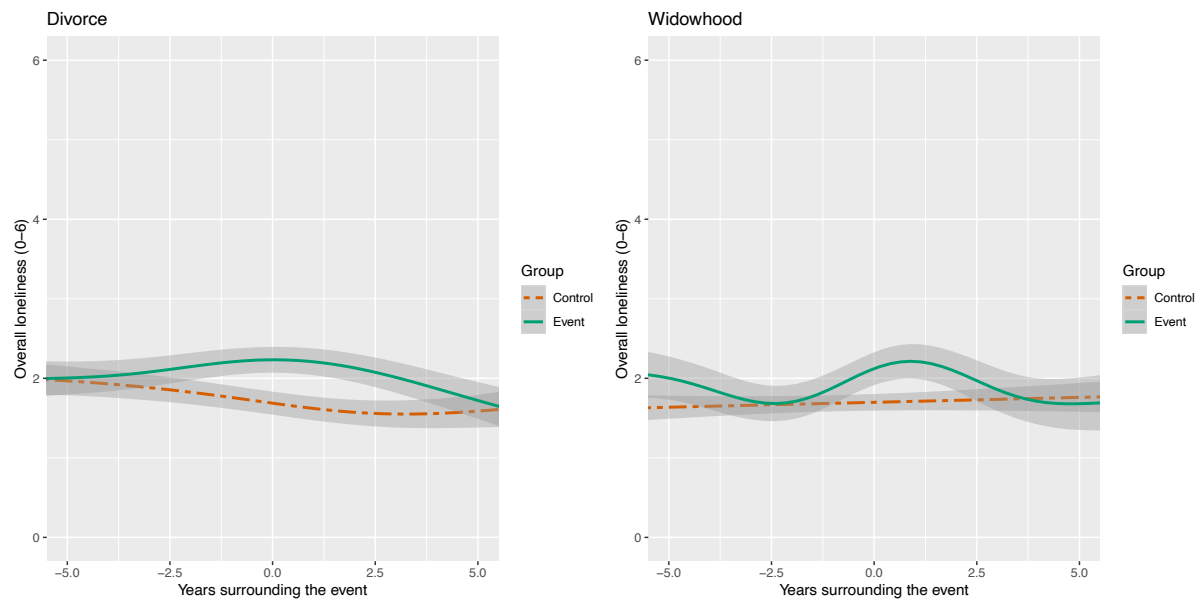


Figure S13. GAMM-estimated average trajectories of loneliness surrounding divorce and widowhood. The green (solid) line represents the event group, the red (dashed) line represents the control group. Event and control group were propensity score matched using 1:1 nearest neighbor matching.

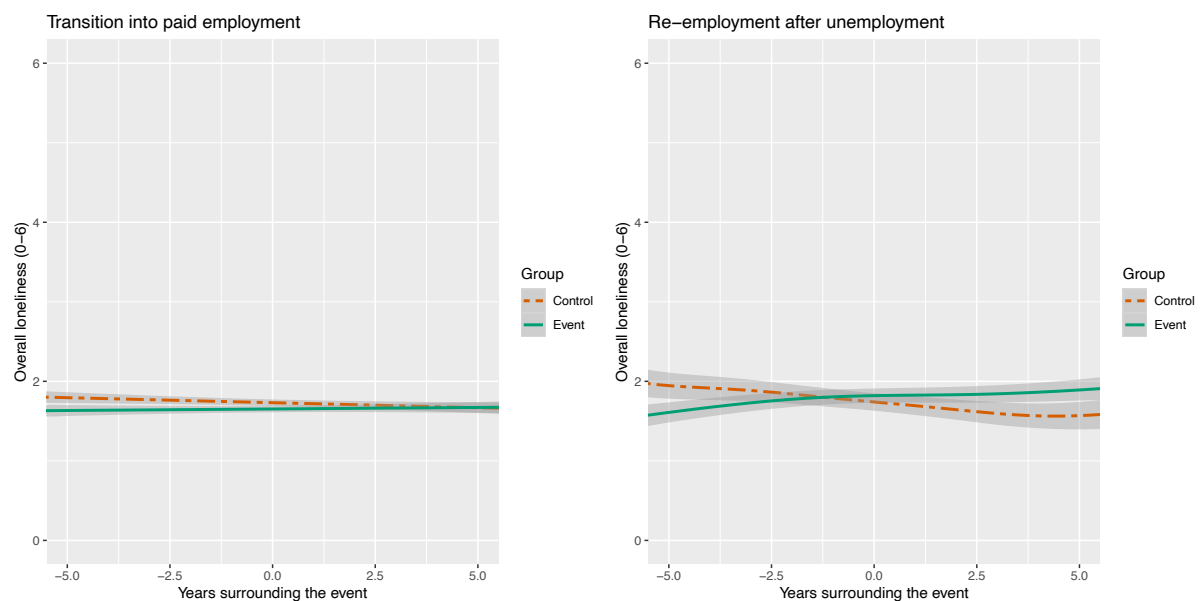


Figure S14. GAMM-estimated average trajectories of loneliness surrounding transition into paid employment and re-employment after unemployment. The green (solid) line represents the event group, the red (dashed) line represents the control group. Event and control group were propensity score matched using 1:1 nearest neighbor matching.

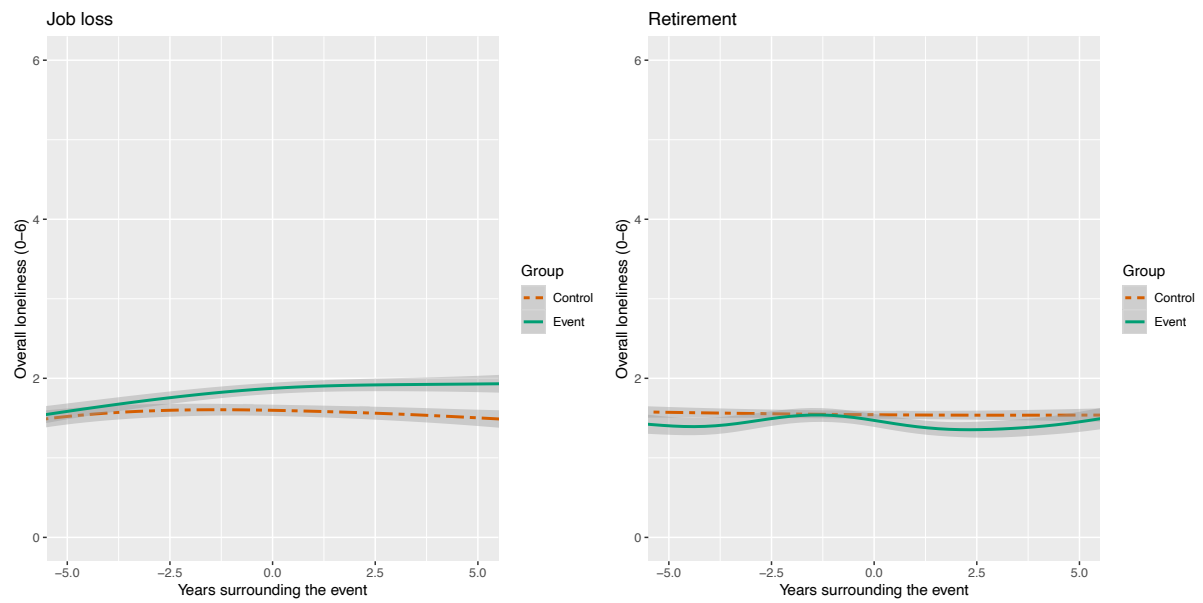


Figure S15. GAMM-estimated average trajectories of loneliness surrounding job loss and retirement. The green (solid) line represents the event group, the red (dashed) line represents the control group. Event and control group were propensity score matched using 1:1 nearest neighbor matching.

References

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