Supplementary Online Materials

Table S1

Means, standard deviations and correlations among the variables

		M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Vital status	0.17	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Life satisfaction: actor	7.28	2.14	-.07***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Life satisfaction: partner	7.28	2.14	-.06***	.37***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Gender: actor	0.50	0.50	.15***	-.02	.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Age: actor	67.19	9.75	.34***	.08***	.09***	.17***	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Age: partner	67.19	9.75	.26***	.09***	.08***	-.17***	.78***	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Ethnicity: actor	0.87	0.34	.000	.10***	.10***	-.003	.11***	.10***	-	-	-	-	-	-	-	-	-	-	-	-
8	Ethnicity: partner	0.87	0.34	.004	.10***	.10***	.003	.10***	.11***	.81***	-	-	-	-	-	-	-	-	-	-	-
9	Education: actor	3.33	1.34	-.12***	.12***	.11***	.005	-.12***	-.11***	.14***	.13***	-	-	-	-	-	-	-	-	-	-
10	Education: partner	3.33	1.34	-.11***	.11***	.12***	-.005	-.11***	-.12***	.13***	.14***	.53***	-	-	-	-	-	-	-	-	-
11	Household income	10.89	0.93	-.14***	.11***	.11***	n/a	-.20***	-.20***	.14***	.14***	.40***	.40***	-	-	-	-	-	-	-	-
12	Same-sex couple	.005	.07	-.003	.01	.01	-.01	-.04***	-.04***	.02	.02	.04***	.04***	.02	-	-	-	-	-	-	-
13	Morbidity: actor	2.21	1.52	.23***	-.16***	-.07***	-.01	.30***	.26***	.01	.01	-.15***	-.15***	-.17***	-.02	-	-	-	-	-	-
14	Morbidity: partner	2.21	1.52	.12***	-.07***	-.16***	.01	.26***	.30***	.01	.01	-.15***	-.15***	-.17***	-.02	.22***	-	-	-	-	-
15	Self-rated health: actor	3.26	1.07	-.26***	.31***	.18***	-.05***	-.14***	-.11***	.12***	.11***	.30***	.27***	.28***	.02*	-.45***	-.13***	-	-	-	-
16	Self-rated health: partner	3.26	1.07	-.09***	.18***	.31***	.05***	-.11***	-.14***	.11***	.12***	.27***	.30***	.28***	.02*	-.13***	-.45***	.25***	-	-	-
17	Perceived partner support	3.27	0.55	-.01	.37***	.27***	.14***	.07***	.01	.10***	.10***	.09***	.13***	.10***	.03*	-.08***	-.07***	.12***	.16***	-	-

18	Physical activity: actor	2.69	1.09	-.19***	.17***	.10***	.11***	-.12***	-.13***	.05***	.06***	.20***	.20***	.18***	.02*	-.26***	-.12***	.35***	.17***	.08***	-
19	Physical activity: partner	2.69	1.09	-.12***	.10***	.17***	-.10***	-.13***	-.12***	.06***	.05***	.20***	.20***	.18***	.02*	-.12***	-.26***	.17***	.35***	.09***	24***

Note. ***$p < .001$, **$p < .01$, *$p < .05$. Vital status: 1=dead, 0=alive; Gender: 1=male, 0=female; Ethnicity: 1=Caucasian, 0=other; Same-sex couple: 1 = yes, 0 = no.

Table S2

Dyadic survival analysis (Cox proportional hazard models) predicting mortality

	Model 1 (n=8,748)		Model 2 (n=8,748)		Model 3 (n=8,590)		Model 4 (n=8,578)	
Predictor	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI
Life satisfaction								
Life satisfaction: partner	0.87***	[0.83; 0.91]	0.92**	[0.87; 0.97]	0.90***	[0.85; 0.95]	0.92**	[0.87; 0.97]
Life satisfaction: actor	-	-	0.86***	[0.82; 0.91]	0.82***	[0.78; 0.86]	0.96	[0.90; 1.02]
Socio-demographics								
Baseline year	-	-	-	-	0.91	[0.81; 1.02]	0.91	[0.81; 1.01]
Gender: actor	-	-	-	-	1.81***	[1.60; 2.06]	1.90***	[1.66; 2.18]
Age: actor	-	-	-	-	2.26***	[2.04; 2.51]	2.13***	[1.91; 2.37]
Age: partner	-	-	-	-	1.11*	[1.01; 1.23]	1.05	[0.95; 1.17]
Ethnicity: actor	-	-	-	-	0.86	[0.64; 1.16]	0.91	[0.67; 1.25]
Ethnicity: partner	-	-	-	-	1.10	[0.82; 1.49]	1.11	[0.80; 1.52]
Education: actor	-	-	-	-	0.91***	[0.87; 0.95]	0.96	[0.92; 1.00]
Education: partner	-	-	-	-	0.96	[0.92; 1.01]	1.00	[0.96; 1.05]
Household income	-	-	-	-	0.93*	[0.87; 0.99]	0.96	[0.90; 1.01]
Same-sex couple	-	-	-	-	2.72*	[1.19; 6.22]	2.97**	[1.38; 6.40]
Health indicators								
Morbidity: actor	-	-	-	-	-	-	1.20***	[1.13; 1.27]

Morbidity: partner	-	-	-	-	-	-	1.01	[0.95; 1.07]
Self-rated health: actor	-	-	-	-	-	-	0.62***	[0.58; 0.66]
Self-rated health: partner	-	-	-	-	-	-	1.06	[1.00; 1.13]
Mortality: partner	-	-	-	-	-	-	1.38***	[1.15; 1.65]

Note. * $p < .05$, ** $p < .01$, ***$p \leq .001$. Subsample: 1=2008, 0=2006; Gender: 1=male, 0=female; Ethnicity: 1=Caucasian, 0=other; Same-sex couple: 1 = yes, 0 = no; Mortality (partner): 1 = deceased, 0 = alive. All models were estimated using the robust sandwich variance estimators in the *survival* package (Therneau, 2015) in R.

Table S3

Dyadic survival analysis (Cox proportional hazard models) predicting mortality (with z-standardized life satisfaction)

	Model 1 (n=8,748)		Model 2 (n=8,748)		Model 3 (n=8,590)		Model 4 (n=8,578)	
Predictor	HR	95% CI	HR	95% CI	HR	95% CI	HR	95% CI
Life satisfaction								
Life satisfaction: partner	0.87***	[0.83; 0.91]	0.92**	[0.87; 0.97]	0.90***	[0.85; 0.95]	0.92**	[0.87; 0.97]
Life satisfaction: actor	-	-	0.86***	[0.82; 0.91]	0.82***	[0.78; 0.87]	0.96	[0.90; 1.02]
Socio-demographics								
Baseline year	-	-	-	-	0.92	[0.84; 1.04]	0.91	[0.81; 1.02]
Gender: actor	-	-	-	-	1.81***	[1.60; 2.06]	1.90***	[1.66; 2.18]
Age: actor	-	-	-	-	2.26***	[2.04; 2.51]	2.13***	[1.92; 2.38]
Age: partner	-	-	-	-	1.11*	[1.01; 1.23]	1.05	[0.95; 1.17]
Ethnicity: actor	-	-	-	-	0.86	[0.64; 1.16]	0.91	[0.67; 1.25]
Ethnicity: partner	-	-	-	-	1.11	[0.82; 1.49]	1.11	[0.80; 1.52]
Education: actor	-	-	-	-	0.91***	[0.87; 0.95]	0.96	[0.92; 1.00]
Education: partner	-	-	-	-	0.96	[0.92; 1.01]	1.00	[0.96; 1.05]
Household income	-	-	-	-	0.93*	[0.87; 0.99]	0.96	[0.90; 1.01]
Same-sex couple	-	-	-	-	2.72*	[1.19; 6.26]	2.97**	[1.38; 6.40]
Health indicators								
Morbidity: actor	-	-	-	-	-	-	1.20***	[1.13; 1.27]
Morbidity: partner	-	-	-	-	-	-	1.01	[0.95; 1.07]
Self-rated health: actor	-	-	-	-	-	-	0.62***	[0.58; 0.66]

Self-rated health: partner	-	-	-	-	-	-	1.06	[1.00; 1.13]
Mortality: partner	-	-	-	-	-	-	1.38***	[1.15; 1.65]

Note. * $p < .05$, ** $p < .01$, ***$p \leq .001$. Subsample: 1=2008, 0=2006; Gender: 1=male, 0=female; Ethnicity: 1=Caucasian, 0=other; Same-sex couple: 1 = yes, 0 = no; Mortality (partner): 1 = deceased, 0 = alive. All models were estimated using the robust sandwich variance estimators in the *survival* package (Therneau, 2015) in R.

Table S4

Dyadic survival analysis predicting mortality. Robustness checks

	Model 1: only married individuals; n=8,228		Model 2: age as time scale		Model 3: frailty model	
Predictor	HR	95%CI	HR	95%CI	HR	SE
Life satisfaction						
Life satisfaction: partner	0.92**	[0.87; 0.98]	0.90***	[0.85; 0.96]	0.92**	0.03
Life satisfaction: actor	0.95	[0.90; 1.01]	0.93*	[0.88; 0.99]	0.96	0.03
Socio-demographics						
Baseline year	0.88*	[0.78; 0.99]	0.79***	[0.70; 0.88]	0.89	0.06
Gender: actor	1.88***	[1.63; 2.16]	1.39***	[1.24; 1.55]	1.90***	0.07
Age: actor	2.13***	[1.91; 2.38]	-	-	2.12***	0.05
Age: partner	1.05	[0.94; 1.17]	-	-	1.05	0.05
Ethnicity: actor	0.88	[0.64; 1.21]	0.70	[0.49; 1.01]	0.91	0.15
Ethnicity: partner	1.16	[0.84; 1.60]	1.15	[0.79; 1.67]	1.11	0.15
Education: actor	0.96	[0.92; 1.00]	0.98	[0.94; 1.02]	0.96	0.02
Education: partner	1.02	[0.97; 1.07]	0.98	[0.94; 1.02]	1.00	0.02
Household income	0.95	[0.90; 1.01]	1.02	[0.94; 1.11]	0.96	0.03
Same-sex couple	15.76***	[4.38; 56.76]	3.81**	[1.67; 8.68]	2.96**	0.41
Health indicators						
Morbidity: actor	1.21***	[1.14; 1.28]	1.14***	[1.07; 1.20]	1.20***	0.03

Morbidity: partner	1.01	[0.95; 1.07]	0.98	[0.93; 1.04]	1.01	0.03
Self-rated health: actor	0.62***	[0.58; 0.67]	0.68***	[0.62; 0.71]	0.62***	0.03
Self-rated health: partner	1.05	[0.99; 1.12]	1.07*	[1.01; 1.14]	1.06	0.03
Mortality: partner	1.34**	[1.12; 1.61]	0.92	[0.79; 1.08]	1.38***	0.07

Note. ***$p \leq .001$, ** $p < .01$, * $p < .05$. Baseline year: 1=2008, 0=2006; Gender: 1=male, 0=female; Ethnicity: 1=Caucasian, 0=other; Same-sex couple: 1 = yes, 0 = no; Mortality (partner): 1 = deceased, 0 = alive. Models 1 and 2 were estimated using the robust sandwich variance estimators in the *survival* package (Therneau, 2015) in R. Model 3 is a frailty model with a penalized likelihood estimation (Therneau, Grambsch, & Pankratz, 2003) estimated with the frailtypack package in R (Rondeau, Mazroui, & Gonzalez, 2012).

Table S5

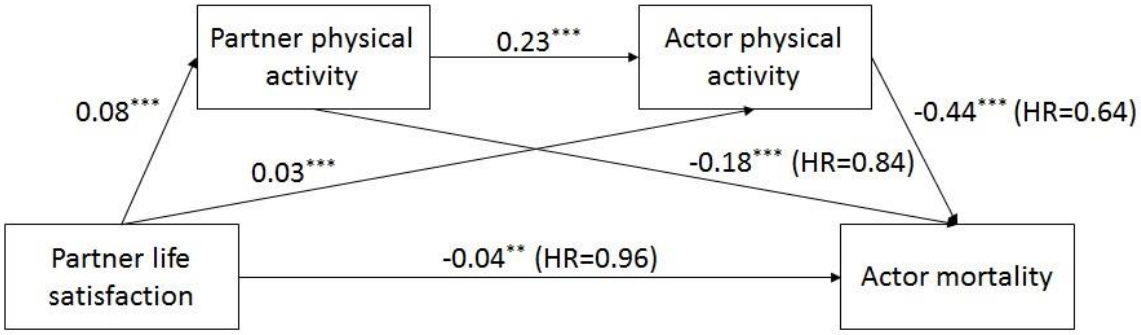
Multilevel structural equation model testing sequential mediation via partner and actor physical activity

Predictor	DV: partner physical activity *b* (*p*)	DV: actor physical activity *b* (*p*)	DV: actor mortality HR (*p*)
Model 1: without control variables			
Life satisfaction: partner	.08 (<.001)	.03 (<.001)	0.96 (.003)
Physical activity: partner	-	.23 (<.001)	0.84 (<.001)
Physical activity: actor	-	-	0.64 (<.001)
Model 2: with control variables			
Life satisfaction: partner	.03 (<.001)	-.001 (.867)	0.96 (.004)
Physical activity: partner	-	.17 (<.001)	1.01 (.785)
Physical activity: actor	-	-	0.80 (<.001)
Control variables			
Life satisfaction: actor	.003 (0.521)	.03 (<.001)	0.99 (.361)
Baseline year	.11 (<.001)	.11 (<.001)	0.96 (.431)
Gender: actor	-.29 (<.001)	.32 (<.001)	2.06 (<.001)
Age: actor	.001 (.666)	-.01 (.002)	1.08 (<.001)
Age: partner	-.004 (.031)	.002 (.455)	1.01 (.372)
Ethnicity: actor	.07 (.115)	-.05 (.339)	0.94 (.695)
Ethnicity: partner	-.07 (.175)	.07 (.170)	1.10 (.566)
Education: actor	.04 (<.001)	.04 (.001)	0.96 (.108)
Education: partner	.04 (<.001)	.03 (.001)	1.02 (.541)
Household income	.04 (.003)	.03 (.002)	0.96 (.232)
Same-sex couple	.11 (.547)	.07 (.527)	2.84 (.009)
Morbidity: actor	-.02 (.041)	-.06 (<.001)	1.11 (<.001)
Morbidity: partner	-.06 (<.001)	-.01 (.569)	1.00 (.906)
Self-rated health: actor	.02 (.060)	.24 (<.001)	0.67 (<.001)
Self-rated health: partner	.23 (<.001)	-.02 (.082)	1.05 (.136)
Mortality: partner	-	-	1.38 (<.001)

Note. Baseline year: 1=2008, 0=2006; Gender: 1=male, 0=female; Ethnicity: 1=Caucasian, 0=other; Same-sex couple: 1 = yes, 0 = no; Mortality (partner) was not included as a predictor of partner and actor physical activity as partner death (IV) could only occur after the measures of physical activity were collected (DVs).

Figure S1

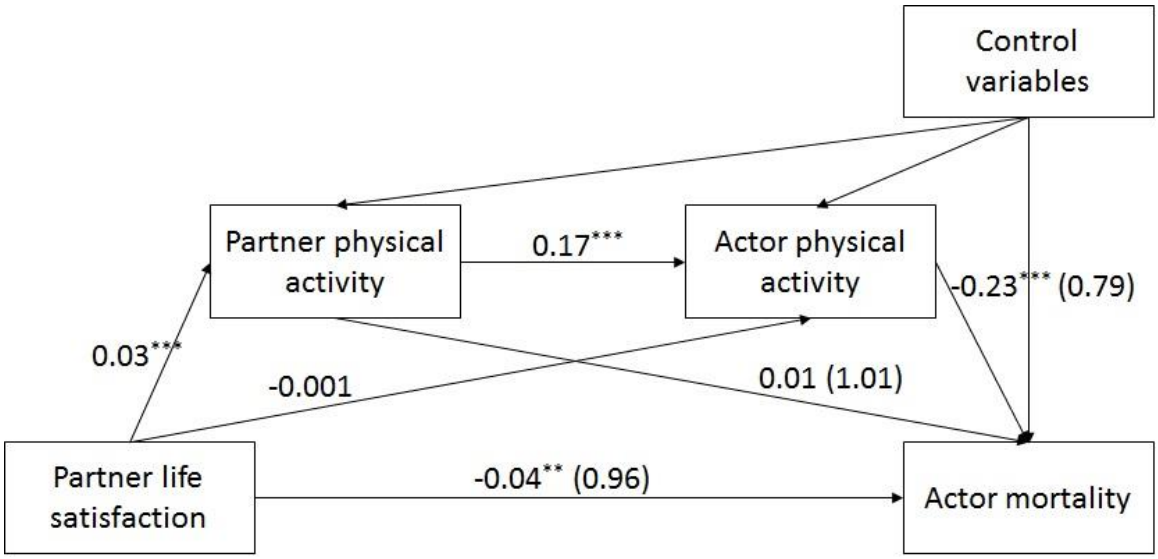
Multilevel structural equation model testing sequential mediation via partner and actor physical activity (without the control variables, see Model 1 in Table S5)



Note. $^{***}p < .001$, $^{**}p < .01$. N = 8,416.
Indirect effect „Partner life satisfaction -> Partner physical activity -> Actor physical activity -> Actor mortality": -0.008, 95% CI [-0.01; -0.006].
Displayed coefficients are unstandardized path coefficients (for Cox regression: HR in brackets).
The model includes random intercepts of partner physical activity, actor physical activity and actor mortality.

Figure S2

Multilevel structural equation model testing sequential mediation via partner and actor physical activity (with the control variables, see Model 2 in Table S5)



Note. $^{***}p < .001$, $^{**}p < .01$. N = 8,416.
Indirect effect „Partner life satisfaction -> Partner physical activity -> Actor physical activity -> Actor mortality": -0.001, 95% CI [-0.02; -0.0006].
Displayed coefficients are unstandardized path coefficients (for Cox regression: HR in brackets).
The model includes random intercepts of partner physical activity, actor physical activity and actor mortality.

Perceived partner support scale

(items' origin: Turner, Frankel and Levin 1983)

We would now like to ask you some questions about your partner or spouse. Please mark the answer which best shows how you feel about each statement.

1. How much do they really understand the way you feel about things?
2. How much can you rely on them if you have a serious problem?
3. How much can you open up to them if you need to talk about your worries?
4. How often do they make too many demands on you?
5. How much do they criticize you?
6. How much do they let you down when you are counting on them?
7. How much do they get on your nerves?

References

Rondeau, V., Mazroui, Y., & Gonzalez, J. R. (2012). frailtypack: An R Package for the Analysis of Correlated Survival Data with Frailty Models Using Penalized Likelihood Estimation or Parametrical Estimation. *Journal of Statistical Software, 47*(4), 1-28. URL http://www.jstatsoft.org/v47/i04/. .

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Therneau, T. M., Grambsch, P. M., & Pankratz, V. S. (2003). Penalized Survival Models and Frailty. *Journal of Computational and Graphical Statistics, 12*(1), 156-175.

Turner, R. J., G. Frankel, and D. M. Levin. 1983. "Social support: Conceptualization, measurement, and implications for mental health." Pp. 67-111 in *Research in Community and Mental Health*, edited by J.R. Greenley and R.G. Simmons. Greenwich: JAI Press.