SUPPLEMENTARY FIGURES AND TABLES FOR:

Social connectedness is associated with fibrinogen level in a human social network

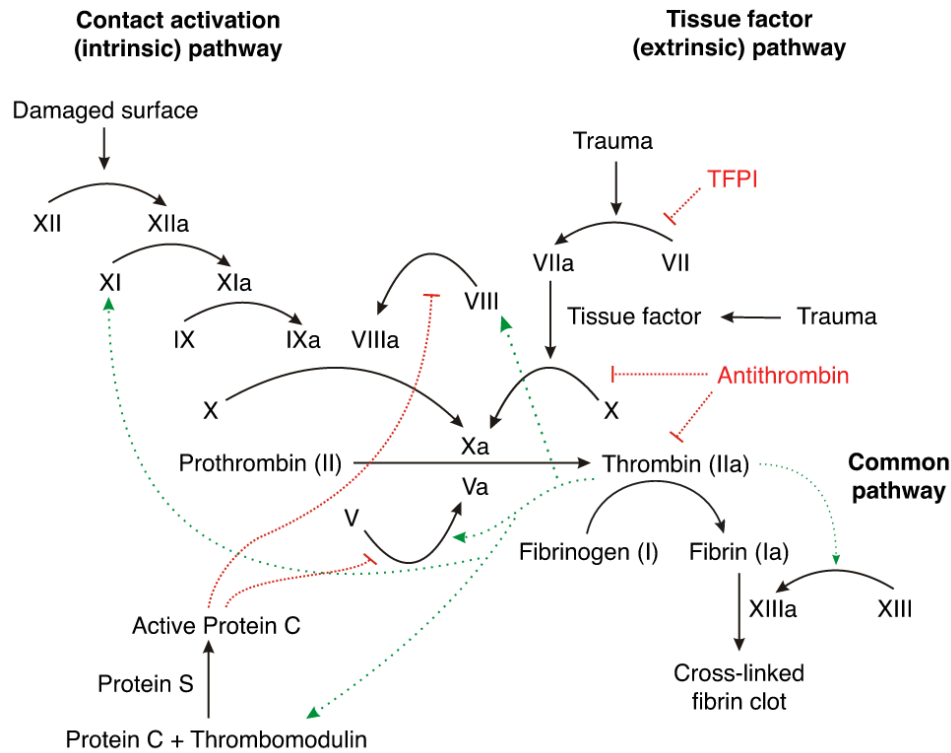David A. Kim, M.D., Ph.D.
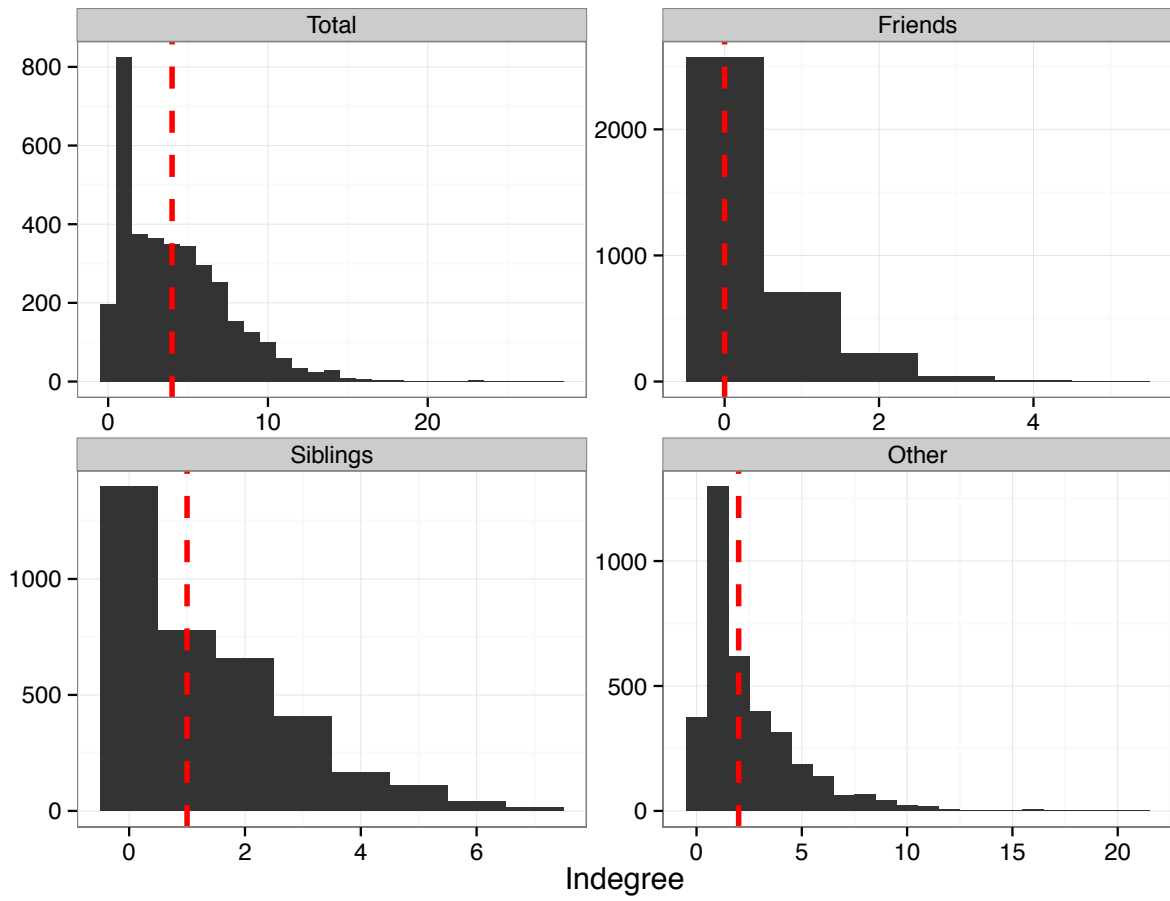
Emelia J. Benjamin, M.D., Sc.M.

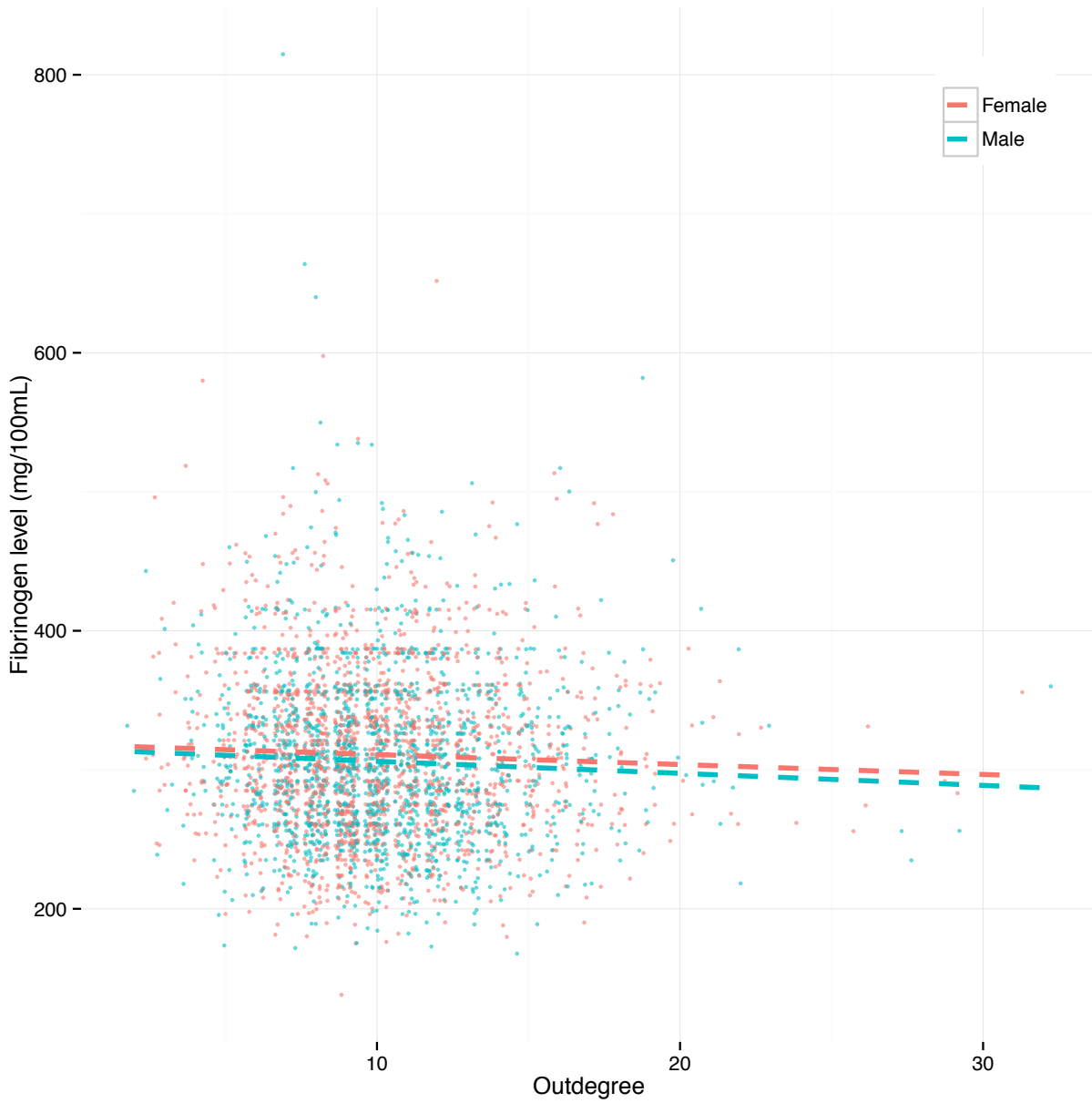James H. Fowler, Ph.D.

Nicholas A. Christakis, M.D., Ph.D.

Figure S1 | Conversion of fibrinogen to fibrin by thrombin results in clot formation. The coagulation cascade is highly conserved across mammals. When the vascular endothelium is damaged by trauma, the exposure of subendothelial collagen and tissue factor trigger a sequence of reactions in which enzymes cleave downstream precursors into their enzymatically active (a) forms, terminating in the conversion by thrombin (Factor IIa) of fibrinogen (Factor I) to fibrin (Factor Ia). Fibrin is cross-linked by factor XIIIa to form a clot. Elevated levels of coagulation factors, including fibrinogen, produce a hypercoagulable state, increasing the risk of thrombotic disorders such as ischaemic heart disease and stroke.

Figure S2 | Distributions of indegree, by edge type. Total indegree reflects ties of friendship, sibship, marriage, and other relatives. Dashed red lines indicate median values for the 3,568 individuals with fibrinogen measurements.

Figure S3 | Outdegree is weakly associated with fibrinogen levels. The number of social contacts named by a subject is weakly associated with the subject's fibrinogen level (r = -0.04, p = 0.007). Points are jittered horizontally to better depict the density of the data around discrete values of indegree.

Table S1 | Linear models regressing fibrinogen levels on indegree

	Model 1a (Minimal model, adjusting for age, sex, education)			Model 1b (Additionally adjusting for cardiac risk factors, and medication use)		
	Estimate	SE	p	Estimate	SE	p
Intercept	270.24	9.28	0.00	235.78	13.51	0.00
Indegree	**-2.03**	**0.30**	**0.00**	**-1.99**	**0.28**	**0.00**
Age	1.44	0.11	0.00	1.28	0.12	0.00
Male	-3.06	2.07	0.14	-13.52	2.21	0.00
Years of education	-2.29	0.40	0.00	-1.09	0.38	0.00
BMI				2.37	0.22	0.00
Smoking				23.15	2.53	0.00
Systolic BP 1				0.05	0.14	0.74
Systolic BP 2				0.09	0.13	0.50
Diastolic BP 1				-0.36	0.21	0.08
Diastolic BP 2				0.02	0.21	0.92
HDL cholesterol				-0.51	0.07	0.00
Total cholesterol				0.08	0.03	0.00
Anti-cholesterol 1				-10.94	8.41	0.19
Anti-cholesterol 2				-5.28	7.27	0.47
Anti-cholesterol 3				27.32	6.33	0.00
Anti-cholesterol 4				-3.99	4.47	0.37
Anti-cholesterol 5				-11.09	17.66	0.53
Renin-angiotensin blocker				7.96	3.41	0.02
Beta blocker				-0.51	3.05	0.87
Calcium channel blocker				8.73	3.46	0.01
Diuretic 1				3.79	9.09	0.68
Diuretic 2				6.20	5.72	0.28
Diuretic 3				10.21	4.50	0.02
Diuretic 4				4.08	11.39	0.72
Anti-depressant				-1.60	4.37	0.71
N	3057			3028		
DF	3052			3002		
Adjusted R^2	0.099			0.207		

	Model 2a (Additionally adjusting for social contacts' fibrinogen)			Model 2b (Friendship ties only)		
	Estimate	**SE**	**p**	**Estimate**	**SE**	**p**
Intercept	197.50	15.41	0.00	185.26	15.33	0.00
Indegree	**-1.86**	**0.29**	**0.00**	**-4.73**	**1.37**	**0.00**
Age	1.16	0.13	0.00	1.24	0.13	0.00
Male	-13.36	2.31	0.00	-12.95	2.32	0.00
Years of education	-0.97	0.41	0.02	-0.95	0.41	0.02
BMI	2.28	0.23	0.00	2.29	0.23	0.00
Smoking	22.59	2.68	0.00	22.75	2.69	0.00
Systolic BP 1	0.09	0.14	0.55	0.12	0.14	0.42
Systolic BP 2	0.02	0.14	0.90	0.00	0.14	0.98
Diastolic BP 1	-0.28	0.22	0.20	-0.33	0.22	0.13
Diastolic BP 2	0.08	0.22	0.71	0.08	0.22	0.73
HDL cholesterol	-0.48	0.08	0.00	-0.47	0.08	0.00
Total cholesterol	0.07	0.03	0.01	0.07	0.03	0.01
Anti-cholesterol 1	-13.4	8.59	0.12	-13.48	8.63	0.12
Anti-cholesterol 2	-5.8	7.44	0.44	-5.97	7.48	0.42
Anti-cholesterol 3	30.06	6.45	0.00	31.06	6.48	0.00
Anti-cholesterol 4	-2.15	4.87	0.66	-1.74	4.89	0.72
Anti-cholesterol 5	-9.69	18.65	0.60	-10.27	18.75	0.58
Renin-angiotensin blocker	10.74	3.56	0.00	11.32	3.57	0.00
Beta blocker	-1.31	3.16	0.68	-1.00	3.18	0.75
Calcium channel blocker	7.74	3.57	0.03	7.81	3.59	0.03
Diuretic 1	6.14	9.35	0.51	5.97	9.40	0.52
Diuretic 2	8.66	5.83	0.14	8.39	5.86	0.15
Diuretic 3	11.27	4.65	0.02	10.80	4.68	0.02
Diuretic 4	1.94	11.63	0.87	2.36	11.69	0.84
Anti-depressant	-3.34	4.66	0.47	-3.85	4.69	0.41
Mean fibrinogen of contacts	0.12	0.02	0.00	0.13	0.02	0.00
N	2724			2724		
DF	2697			2697		
Adjusted R^2	0.217			0.209		

	Model 2c (Sibship ties only)			Model 3a (Log_e-transforming indegree and fibrinogen)		
	Estimate	**SE**	**p**	**Estimate**	**SE**	**p**
Intercept	198.07	15.50	0.00	5.38	0.05	0.00
Indegree	**-3.83**	**0.67**	**0.00**	**-0.04**	**0.01**	**0.00**
Age	1.18	0.13	0.00	0.00	0.00	0.00
Male	-12.95	2.31	0.00	-0.04	0.01	0.00
Years of education	-1.14	0.41	0.01	-0.00	0.00	0.01
BMI	2.26	0.23	0.00	0.01	0.00	0.00
Smoking	22.59	2.68	0.00	0.07	0.01	0.00
Systolic BP 1	0.10	0.14	0.49	0.00	0.00	0.65
Systolic BP 2	0.02	0.14	0.89	0.00	0.00	0.89
Diastolic BP 1	-0.35	0.22	0.11	-0.00	0.00	0.20
Diastolic BP 2	0.11	0.22	0.61	0.00	0.00	0.54
HDL cholesterol	-0.49	0.08	0.00	-0.00	0.00	0.00
Total cholesterol	0.07	0.03	0.02	0.00	0.00	0.00
Anti-cholesterol 1	-12.46	8.60	0.15	-0.04	0.03	0.15
Anti-cholesterol 2	-5.44	7.45	0.47	-0.01	0.02	0.69
Anti-cholesterol 3	29.40	6.46	0.00	0.08	0.02	0.00
Anti-cholesterol 4	-2.38	4.88	0.63	-0.00	0.02	0.75
Anti-cholesterol 5	-7.89	18.68	0.67	-0.02	0.06	0.67
Renin-angiotensin blocker	11.05	3.56	0.00	0.03	0.01	0.01
Beta blocker	-1.14	3.17	0.72	-0.00	0.01	0.96
Calcium channel blocker	7.91	3.57	0.03	0.02	0.01	0.03
Diuretic 1	5.69	9.36	0.54	0.00	0.03	0.97
Diuretic 2	8.05	5.84	0.17	0.03	0.02	0.14
Diuretic 3	11.67	4.65	0.01	0.03	0.01	0.03
Diuretic 4	1.58	11.65	0.89	0.01	0.04	0.84
Anti-depressant	-3.17	4.67	0.50	-0.01	0.01	0.33
Mean fibrinogen of contacts	0.13	0.02	0.00	0.00	0.00	0.00
N	2724			2724		
DF	2697			2697		
Adjusted R^2	0.215			0.232		

	Estimate	SE	p
	Model 3b		
	(Log_e-transforming fibrinogen alone)		
Intercept	5.34	0.05	0.00
Indegree	**-0.01**	**0.00**	**0.00**
Age	0.00	0.00	0.00
Male	-0.04	0.01	0.00
Years of education	-0.00	0.00	0.01
BMI	0.01	0.00	0.00
Smoking	0.07	0.01	0.00
Systolic BP 1	0.00	0.00	0.62
Systolic BP 2	0.00	0.00	0.89
Diastolic BP 1	-0.00	0.00	0.19
Diastolic BP 2	0.00	0.00	0.57
HDL cholesterol	-0.00	0.00	0.00
Total cholesterol	0.00	0.00	0.00
Anti-cholesterol 1	-0.04	0.03	0.14
Anti-cholesterol 2	-0.01	0.02	0.66
Anti-cholesterol 3	0.08	0.02	0.00
Anti-cholesterol 4	-0.00	0.02	0.79
Anti-cholesterol 5	-0.02	0.06	0.69
Renin-angiotensin blocker	0.03	0.01	0.01
Beta blocker	-0.00	0.01	0.96
Calcium channel blocker	0.02	0.01	0.03
Diuretic 1	-0.00	0.03	1.00
Diuretic 2	0.03	0.02	0.15
Diuretic 3	0.03	0.01	0.03
Diuretic 4	0.01	0.04	0.85
Anti-depressant	-0.01	0.01	0.35
Mean fibrinogen of contacts	0.00	0.00	0.00
N	2724		
DF	2697		
Adjusted R^2	0.228		

Table S2 | Linear models regressing fibrinogen levels on outdegree

	Model 4 (Adjusting for age, sex, education, cardiac risk factors, and medication use)			Model 5a (Additionally adjusting for social contacts' fibrinogen)		
	Estimate	SE	p	Estimate	SE	p
Intercept	234.50	14.00	0.00	193.73	15.88	0.00
Outdegree	**-0.92**	**0.29**	**0.00**	**-0.84**	**0.31**	**0.01**
Age	1.36	0.12	0.00	1.23	0.13	0.00
Male	-13.02	2.22	0.00	-12.63	2.32	0.00
Years of education	-1.17	0.39	0.00	-1.05	0.41	0.01
BMI	2.37	0.22	0.00	2.28	0.23	0.00
Smoking	-23.29	2.55	0.00	-22.65	2.69	0.00
Systolic BP 1	0.07	0.14	0.62	0.11	0.14	0.46
Systolic BP 2	0.08	0.13	0.53	0.02	0.14	0.89
Diastolic BP 1	-0.42	0.21	0.05	-0.34	0.22	0.12
Diastolic BP 2	0.02	0.21	0.92	0.08	0.22	0.71
HDL cholesterol	-0.51	0.07	0.00	-0.48	0.08	0.00
Total cholesterol	0.08	0.03	0.00	0.07	0.03	0.01
Anti-cholesterol 1	-11.96	8.47	0.16	-14.05	8.64	0.10
Anti-cholesterol 2	-5.80	7.32	0.43	-6.12	7.49	0.41
Anti-cholesterol 3	27.47	6.37	0.00	30.37	6.49	0.00
Anti-cholesterol 4	-2.62	4.50	0.56	-0.94	4.90	0.85
Anti-cholesterol 5	-9.20	17.79	0.61	-8.14	18.76	0.66
Renin-angiotensin blocker	8.46	3.43	0.01	11.27	3.58	0.00
Beta blocker	-0.44	3.07	0.89	-1.16	3.18	0.72
Calcium channel blocker	9.16	3.48	0.01	8.18	3.59	0.02
Diuretic 1	3.86	9.16	0.67	6.38	9.40	0.50
Diuretic 2	5.52	5.76	0.34	8.13	5.87	0.17
Diuretic 3	10.12	4.54	0.03	11.36	4.68	0.02
Diuretic 4	3.41	11.47	0.77	1.61	11.71	0.89
Anti-depressant	-1.66	4.40	0.71	-3.22	4.69	0.49
Mean fibrinogen of contacts				0.13	0.02	0.00
N	3028			2724		
DF	3002			2697		
Adjusted R^2	0.196			0.208		

	Model 5b (Friendship ties only)		
	Estimate	**SE**	**p**
Intercept	182.08	15.63	0.00
Outdegree	**0.11**	**2.06**	**0.96**
Age	1.25	0.13	0.00
Male	-12.66	2.32	0.00
Years of education	-0.93	0.41	0.02
BMI	2.28	0.23	0.00
Smoking	-22.77	2.70	0.00
Systolic BP 1	0.11	0.14	0.43
Systolic BP 2	0.02	0.14	0.91
Diastolic BP 1	-0.36	0.22	0.10
Diastolic BP 2	0.09	0.22	0.67
HDL cholesterol	-0.47	0.08	0.00
Total cholesterol	0.07	0.03	0.01
Anti-cholesterol 1	-13.60	8.65	0.12
Anti-cholesterol 2	-6.33	7.50	0.40
Anti-cholesterol 3	30.67	6.50	0.00
Anti-cholesterol 4	-1.26	4.90	0.80
Anti-cholesterol 5	-8.75	18.79	0.64
Renin-angiotensin blocker	11.33	3.58	0.00
Beta blocker	-1.04	3.18	0.75
Calcium channel blocker	7.91	3.60	0.03
Diuretic 1	5.99	9.42	0.52
Diuretic 2	8.51	5.87	0.15
Diuretic 3	11.66	4.68	0.01
Diuretic 4	2.42	11.72	0.84
Anti-depressant	-3.30	4.70	0.48
Mean fibrinogen of contacts	0.13	0.02	0.00
N	2724		
DF	2697		
Adjusted R^2	0.205		