LET'S SAY AMEN FOR LATENT SPACE MODELS

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Response to Cranmer et al. (2016).

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1. Replication Results

	Logit	MRQAP	LSM	ERGM	AME
Intercept/Edges	-4.44*	-4.24*	0.94*	-12.17*	-3.39*
	(0.34)		[0.09; 1.82]	(1.40)	[-4.38; -2.50]
Conflicting policy preferences					
Business vs. NGO	-0.86	-0.87*	-1.37*	-1.11*	-1.37*
	(0.46)		[-2.42; -0.41]	(0.51)	[-2.44; -0.47]
Opposition/alliance	1.21*	1.14*	0.00	1.22*	1.08*
	(0.20)		[-0.40; 0.39]	(0.20)	[0.72; 1.47]
Preference dissimilarity	-0.07	-0.60	-1.76*	-0.44	-0.79*
	(0.37)		[-2.62; -0.90]	(0.39)	[-1.55; -0.08]
Transaction costs					
Joint forum participation	0.88*	0.75*	1.51*	0.90*	0.92*
	(0.27)		[0.86; 2.17]	(0.28)	[0.40; 1.47]
Influence					
Influence attribution	1.20*	1.29*	0.08	1.00*	1.09*
	(0.22)		[-0.40; 0.55]	(0.21)	[0.69; 1.53]
Alter's influence indegree	0.10*	0.11*	0.01	0.21*	0.11*
	(0.02)		[-0.03; 0.04]	(0.04)	[0.07; 0.15]
Influence absolute diff.	-0.03*	-0.06*	0.04	-0.05*	-0.07*
	(0.02)		[-0.01; 0.09]	(0.01)	[-0.11; -0.03]
Alter = Government actor	0.63*	0.68	-0.46	1.04*	0.55
	(0.25)		[-1.08; 0.14]	(0.34)	[-0.07; 1.15]
Functional requirements					
Ego = Environmental NGO	0.88*	0.99	-0.60	0.79*	0.67
	(0.26)		[-1.32; 0.09]	(0.17)	[-0.38; 1.71]
Same actor type	0.74*	1.12*	1.17*	0.99*	1.04*
	(0.22)		[0.63; 1.71]	(0.23)	[0.63; 1.50]
Endogenous dependencies					
Mutuality	1.22*	1.00*		0.81*	
	(0.21)			(0.25)	
Outdegree popularity				0.95*	
				(0.09)	
Twopaths				-0.04*	
				(0.02)	
GWIdegree (2.0)				3.42*	
				(1.47)	
GWESP (1.0)				0.58*	
				(0.16)	
GWOdegree (0.5)				8.42*	
				(2.11)	

Table 1. * $p < 0.05$ (or 0 outside the 95% confidence interval).

2. Capturing Network Stuff

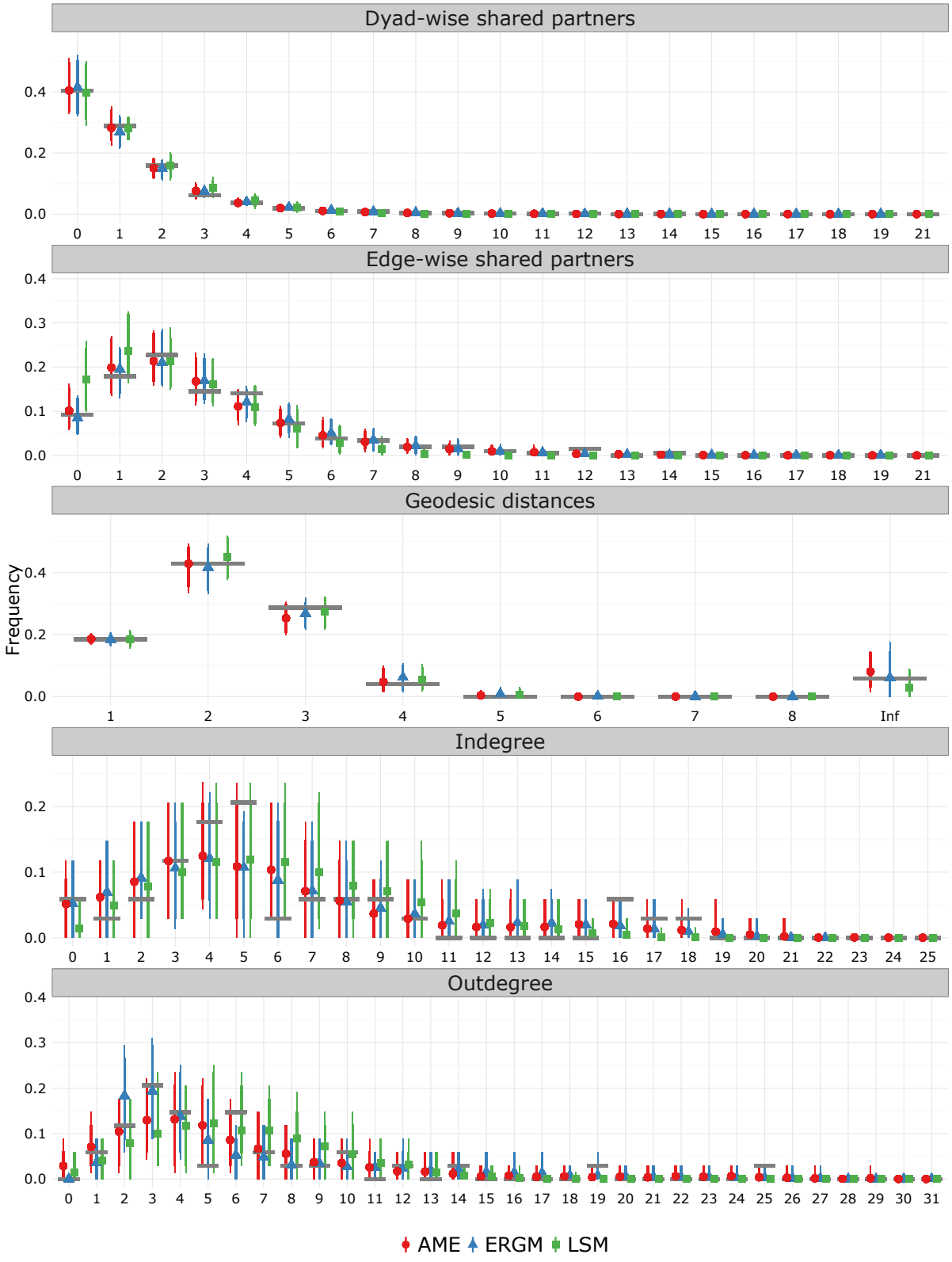

Figure 1. network stats

3. Tie Formation Prediction

	AUC	AUC (PR)
AME	0.99	0.94
LSM	0.92	0.68
ERGM	0.91	0.70
MRQAP	0.88	0.67
Logit	0.88	0.67

Table 2. Area under the curve (AUC) comparison.

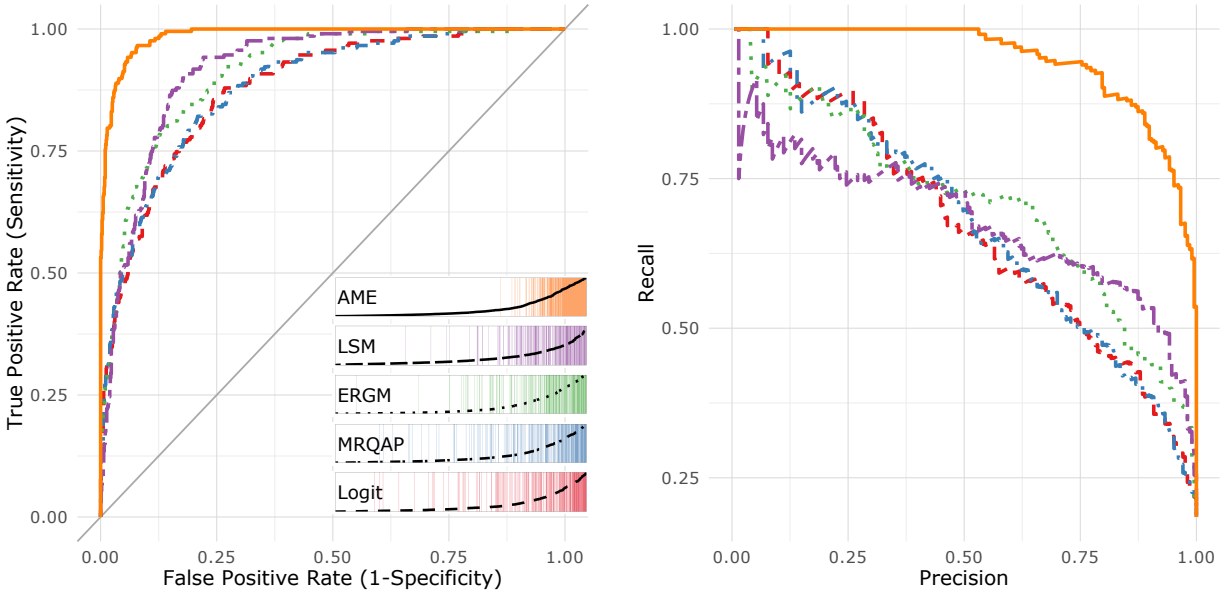

Figure 2. ROC and separation plots

4. Latent Space Model Comparison

	LSM	LSM (Bilinear)	LSM (SR)	LSM (Bilinear + SR)	AME
Intercept/Edges	0.94*	-2.66*	0.60	-2.50*	-3.39*
	[0.09; 1.82]	[-3.53; -1.87]	[-1.10; 2.37]	[-4.14; -0.88]	[-4.38; -2.50]
Conflicting policy preferences					
Business vs. NGO	-1.37*	-2.64*	-3.07*	-2.87*	-1.37*
	[-2.42; -0.41]	[-4.61; -0.96]	[-4.77; -1.56]	[-4.63; -1.29]	[-2.44; -0.47]
Opposition/alliance	0.00	0.04	0.31	0.24	1.08*
	[-0.40; 0.39]	[-0.44; 0.54]	[-0.24; 0.86]	[-0.36; 0.82]	[0.72; 1.47]
Preference dissimilarity	-1.76*	-2.00*	-1.88*	-2.20*	-0.79*
	[-2.62; -0.90]	[-3.01; -1.03]	[-3.07; -0.68]	[-3.46; -0.96]	[-1.55; -0.08]
Transaction costs					
Joint forum participation	1.51*	1.24*	1.56*	1.62*	0.92*
	[0.86; 2.17]	[0.53; 1.93]	[0.69; 2.41]	[0.70; 2.52]	[0.40; 1.47]
Influence					
Influence attribution	0.08	-0.08	0.30	0.28	1.09*
	[-0.40; 0.55]	[-0.62; 0.46]	[-0.37; 0.96]	[-0.42; 0.97]	[0.69; 1.53]
Alter's influence indegree	0.01	-0.05*	0.06	0.05	0.11*
	[-0.03; 0.04]	[-0.09; -0.01]	[-0.03; 0.14]	[-0.04; 0.13]	[0.07; 0.15]
Influence absolute diff.	0.04	0.02	-0.08*	-0.08*	-0.07*
	[-0.01; 0.09]	[-0.03; 0.07]	[-0.14; -0.02]	[-0.14; -0.02]	[-0.11; -0.03]
Alter = Government actor	-0.46	-0.80	-0.11	-0.20	0.55
	[-1.08; 0.14]	[-1.67; 0.04]	[-1.91; 1.76]	[-2.14; 1.74]	[-0.07; 1.15]
Functional requirements					
Ego = Environmental NGO	-0.60	-1.90*	-1.69	-1.84	0.67
	[-1.32; 0.09]	[-3.10; -0.86]	[-3.74; 0.23]	[-4.02; 0.11]	[-0.38; 1.71]
Same actor type	1.17*	1.40*	1.82*	1.90*	1.04*
	[0.63; 1.71]	[0.85; 1.95]	[1.10; 2.54]	[1.19; 2.62]	[0.63; 1.50]

Table 3. * $p < 0.05$ (or 0 outside the 95% confidence interval).

	AUC	AUC (PR)
AME	0.99	0.94
LSM (Bilinear + SR)	0.97	0.91
LSM (SR)	0.97	0.90
LSM (Bilinear)	0.93	0.77
LSM	0.92	0.68

Table 4. Area under the curve (AUC) comparison for latent space approaches.

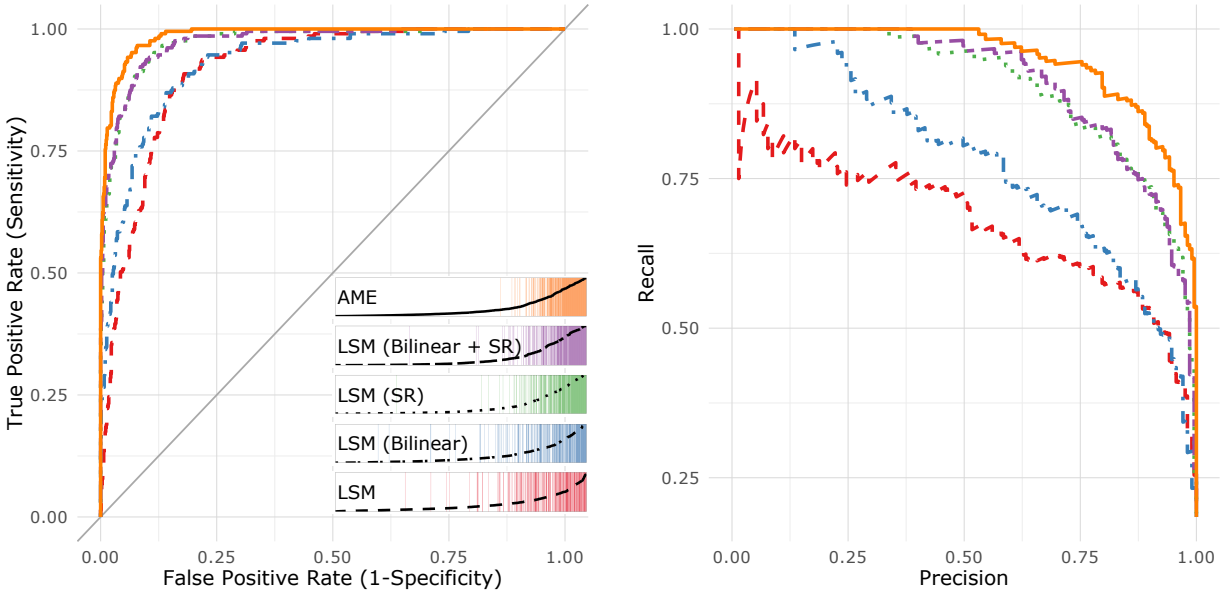

Figure 3. ROC and separation plots

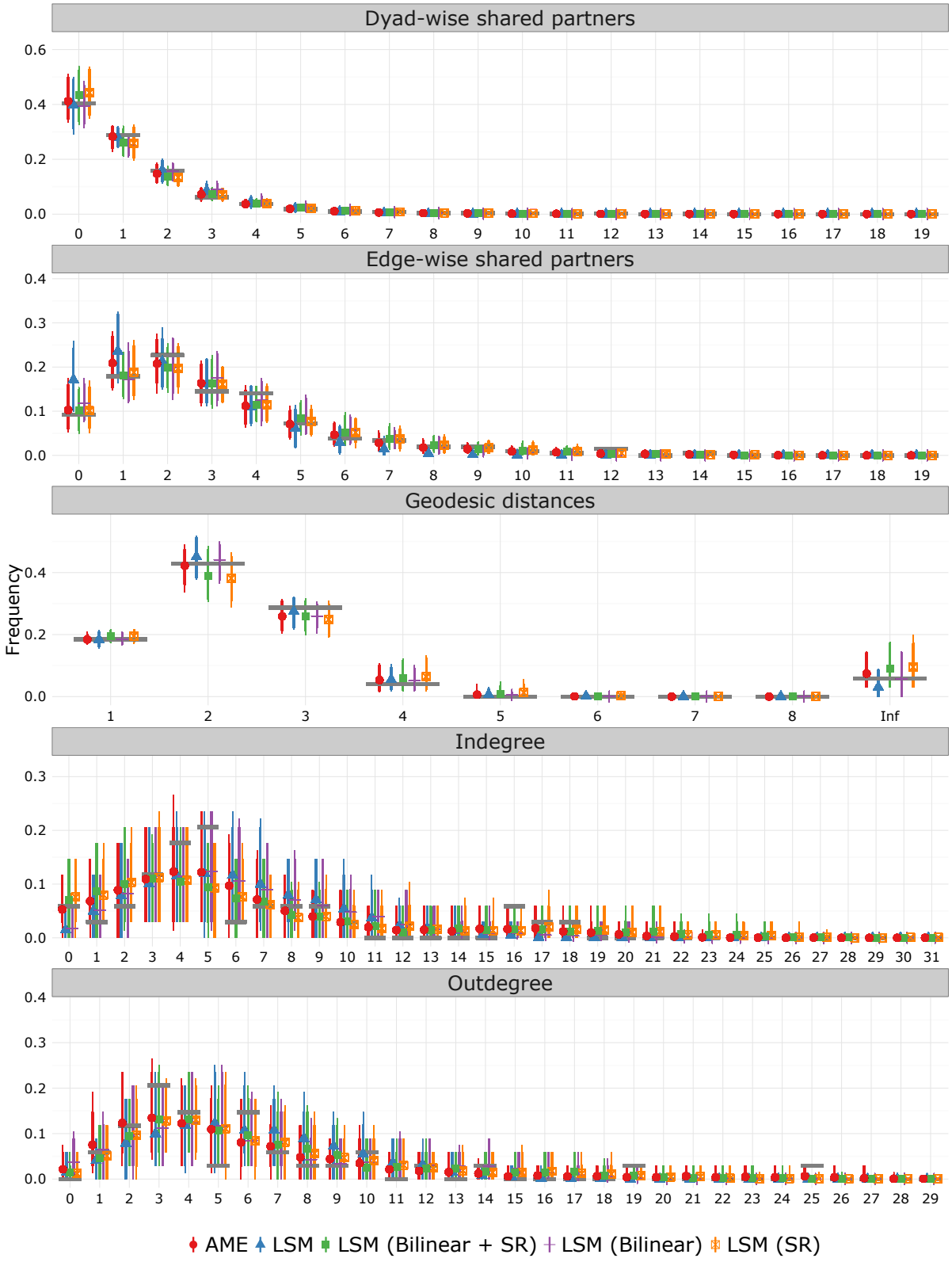

Figure 4. network stats

5. AME Comparison

	AME (k=0)	AME (k=1)	AME (k=2)	AME (k=3)	AME (k=4)
Intercept/Edges	-2.19*	-2.72*	-2.75*	-2.92*	-3.03*
	[-2.55; -1.85]	[-3.41; -1.82]	[-3.59; -1.88]	[-3.81; -2.04]	[-4.03; -1.99]
Conflicting policy preferences					
Business vs. NGO	-0.46	-0.88*	-0.96*	-1.03*	-1.12*
	[-0.95; -0.01]	[-1.64; -0.22]	[-1.86; -0.22]	[-1.96; -0.24]	[-2.15; -0.25]
Opposition/alliance	0.65*	0.79*	0.86*	0.95*	1.03*
	[0.44; 0.86]	[0.53; 1.07]	[0.56; 1.16]	[0.62; 1.32]	[0.67; 1.42]
Preference dissimilarity	-0.52*	-0.49	-0.57	-0.65	-0.75*
	[-0.95; -0.10]	[-1.03; 0.04]	[-1.17; 0.02]	[-1.34; 0.00]	[-1.47; -0.07]
Transaction costs					
Joint forum participation	0.49*	0.68*	0.72*	0.77*	0.81*
	[0.18; 0.79]	[0.30; 1.06]	[0.30; 1.13]	[0.30; 1.24]	[0.31; 1.32]
Influence					
Influence attribution	0.76*	0.86*	0.93*	1.01*	1.08*
	[0.52; 0.99]	[0.56; 1.16]	[0.59; 1.29]	[0.64; 1.41]	[0.68; 1.52]
Alter's influence indegree	0.06*	0.08*	0.08*	0.09*	0.10*
	[0.04; 0.08]	[0.05; 0.10]	[0.05; 0.11]	[0.06; 0.12]	[0.06; 0.14]
Influence absolute diff.	-0.03*	-0.04*	-0.05*	-0.05*	-0.06*
	[-0.05; -0.01]	[-0.07; -0.02]	[-0.08; -0.02]	[-0.09; -0.02]	[-0.09; -0.02]
Alter = Government actor	0.38*	0.51*	0.56*	0.62*	0.67*
	[0.10; 0.64]	[0.13; 0.88]	[0.11; 1.01]	[0.13; 1.14]	[0.10; 1.27]
Functional requirements					
Ego = Environmental NGO	0.49*	0.50	0.54	0.61	0.72
	[0.22; 0.77]	[-0.24; 1.18]	[-0.27; 1.32]	[-0.31; 1.50]	[-0.27; 1.78]
Same actor type	0.74*	0.89*	0.93*	0.98*	1.02*
	[0.49; 1.00]	[0.58; 1.21]	[0.58; 1.28]	[0.60; 1.36]	[0.62; 1.45]

Table 5. * $p < 0.05$ (or 0 outside the 95% confidence interval).

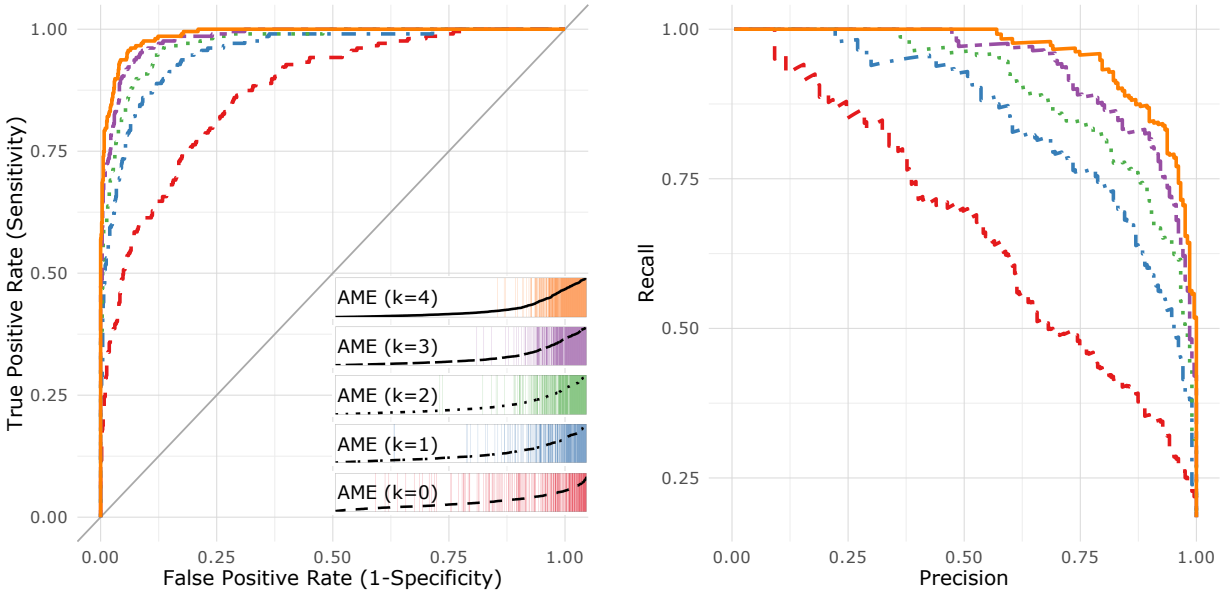

Figure 5. ROC and separation plots

	AME SR (k=0)	AME SR (k=1)	AME SR (k=2)	AME SR (k=3)	AME SR (k=4)
Intercept/Edges	-2.75*	-3.08*	-3.39*	-3.72*	-3.93*
	[-3.43; -2.09]	[-3.91; -2.30]	[-4.38; -2.50]	[-4.84; -2.73]	[-5.12; -2.87]
Conflicting policy preferences					
Business vs. NGO	-1.08*	-1.28*	-1.37*	-1.48*	-1.51*
	[-1.82; -0.41]	[-2.20; -0.47]	[-2.44; -0.47]	[-2.63; -0.49]	[-2.69; -0.47]
Opposition/alliance	0.83*	0.95*	1.08*	1.19*	1.28*
	[0.57; 1.10]	[0.64; 1.27]	[0.72; 1.47]	[0.80; 1.64]	[0.86; 1.77]
Preference dissimilarity	-0.49	-0.65*	-0.79*	-0.89*	-0.95*
	[-1.06; 0.06]	[-1.30; -0.03]	[-1.55; -0.08]	[-1.71; -0.12]	[-1.80; -0.14]
Transaction costs					
Joint forum participation	0.73*	0.84*	0.92*	1.01*	1.06*
	[0.34; 1.12]	[0.38; 1.31]	[0.40; 1.47]	[0.44; 1.62]	[0.43; 1.72]
Influence					
Influence attribution	0.88*	1.00*	1.09*	1.21*	1.28*
	[0.57; 1.19]	[0.63; 1.39]	[0.69; 1.53]	[0.75; 1.71]	[0.80; 1.84]
Alter's influence indegree	0.09*	0.10*	0.11*	0.12*	0.13*
	[0.06; 0.12]	[0.07; 0.14]	[0.07; 0.15]	[0.08; 0.17]	[0.09; 0.18]
Influence absolute diff.	-0.06*	-0.06*	-0.07*	-0.07*	-0.08*
	[-0.08; -0.03]	[-0.10; -0.03]	[-0.11; -0.03]	[-0.12; -0.04]	[-0.12; -0.04]
Alter = Government actor	0.49	0.52	0.55	0.60	0.64
	[-0.01; 0.99]	[-0.04; 1.07]	[-0.07; 1.15]	[-0.07; 1.27]	[-0.07; 1.35]
Functional requirements					
Ego = Environmental NGO	0.54	0.61	0.67	0.76	0.80
	[-0.28; 1.36]	[-0.31; 1.56]	[-0.38; 1.71]	[-0.38; 1.90]	[-0.40; 2.04]
Same actor type	0.88*	0.97*	1.04*	1.11*	1.17*
	[0.55; 1.21]	[0.60; 1.35]	[0.63; 1.50]	[0.64; 1.59]	[0.68; 1.68]

Table 6. * $p < 0.05$ (or 0 outside the 95% confidence interval).

	AUC	AUC (PR)
AME (k=4)	0.99	0.95
AME (k=3)	0.98	0.93
AME (k=2)	0.97	0.89
AME (k=1)	0.95	0.85
AME (k=0)	0.87	0.66

Table 7. Area under the curve (AUC) comparison for latent space approaches.

	AUC	AUC (PR)
AME SR (k=4)	1.00	0.98
AME SR (k=3)	0.99	0.97
AME SR (k=2)	0.99	0.94
AME SR (k=1)	0.97	0.90
AME SR (k=0)	0.95	0.83

Table 8. Area under the curve (AUC) comparison for latent space approaches.

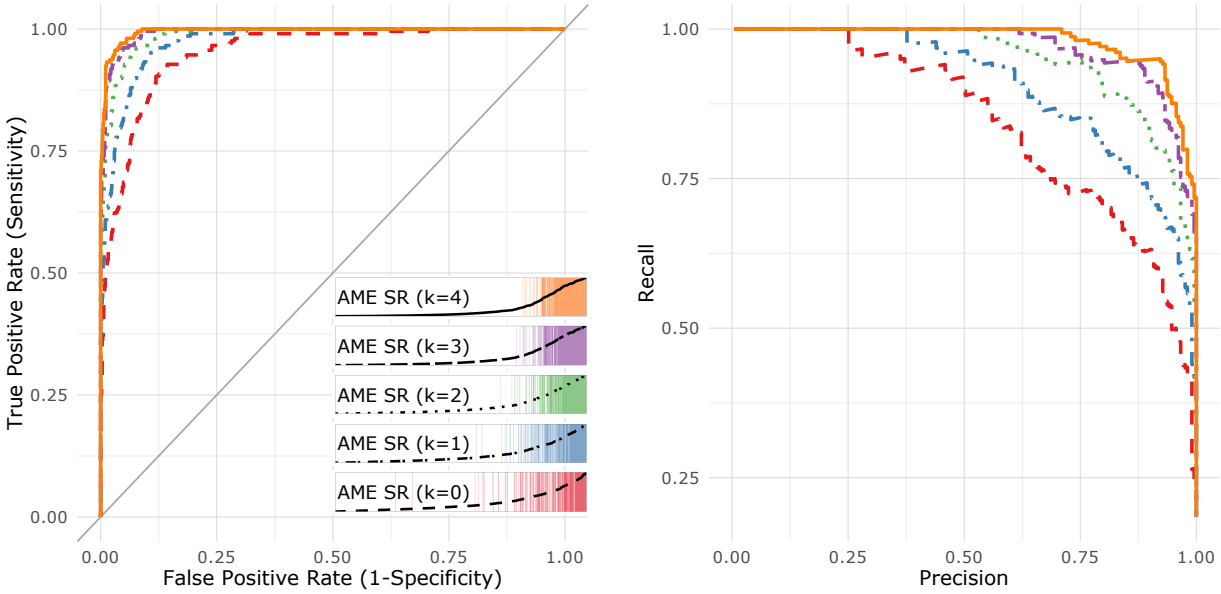

Figure 6. ROC and separation plots

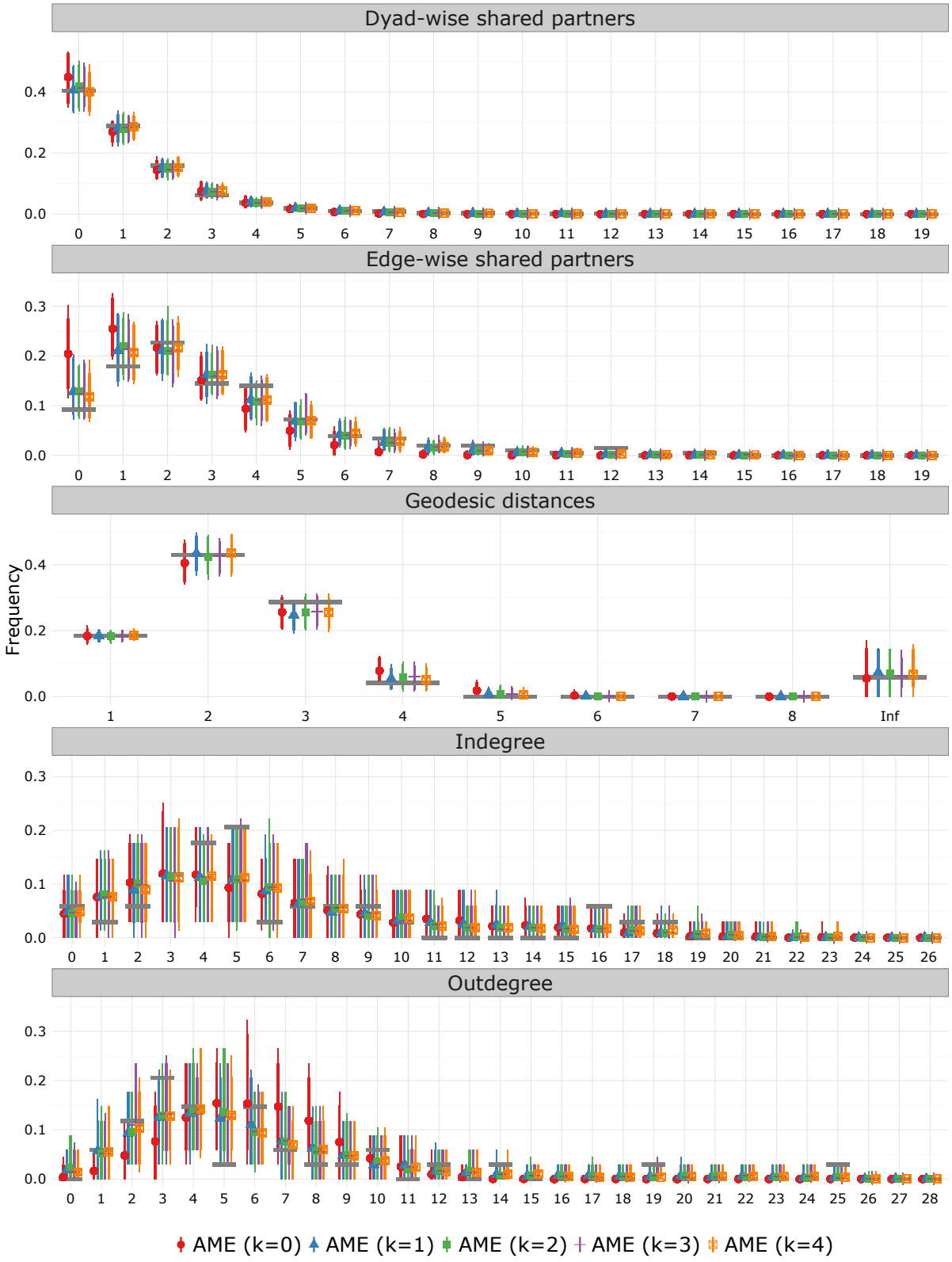

Figure 7. network stats

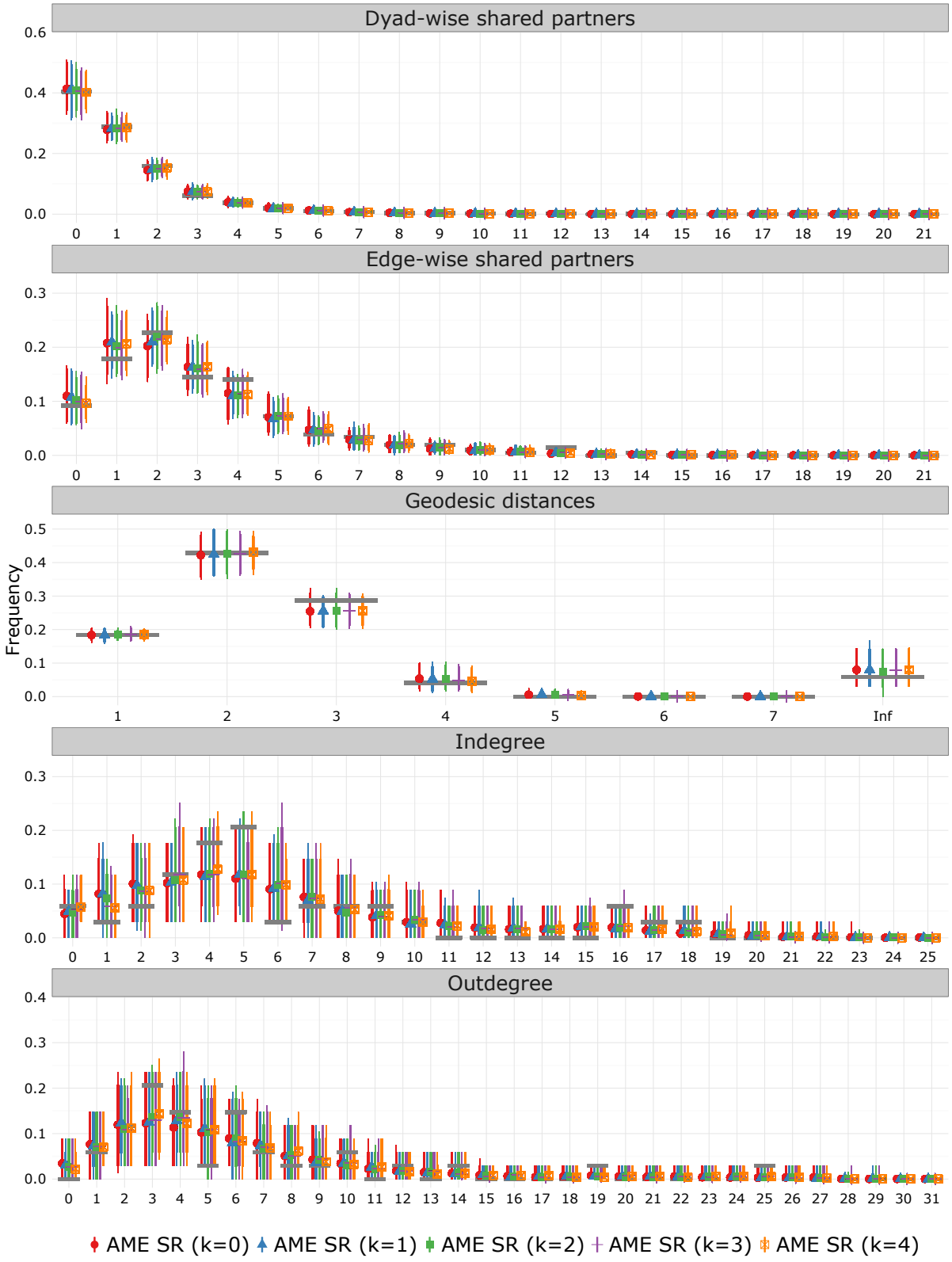

Figure 8. network stats

6. Conclusion

7. APPENDIX

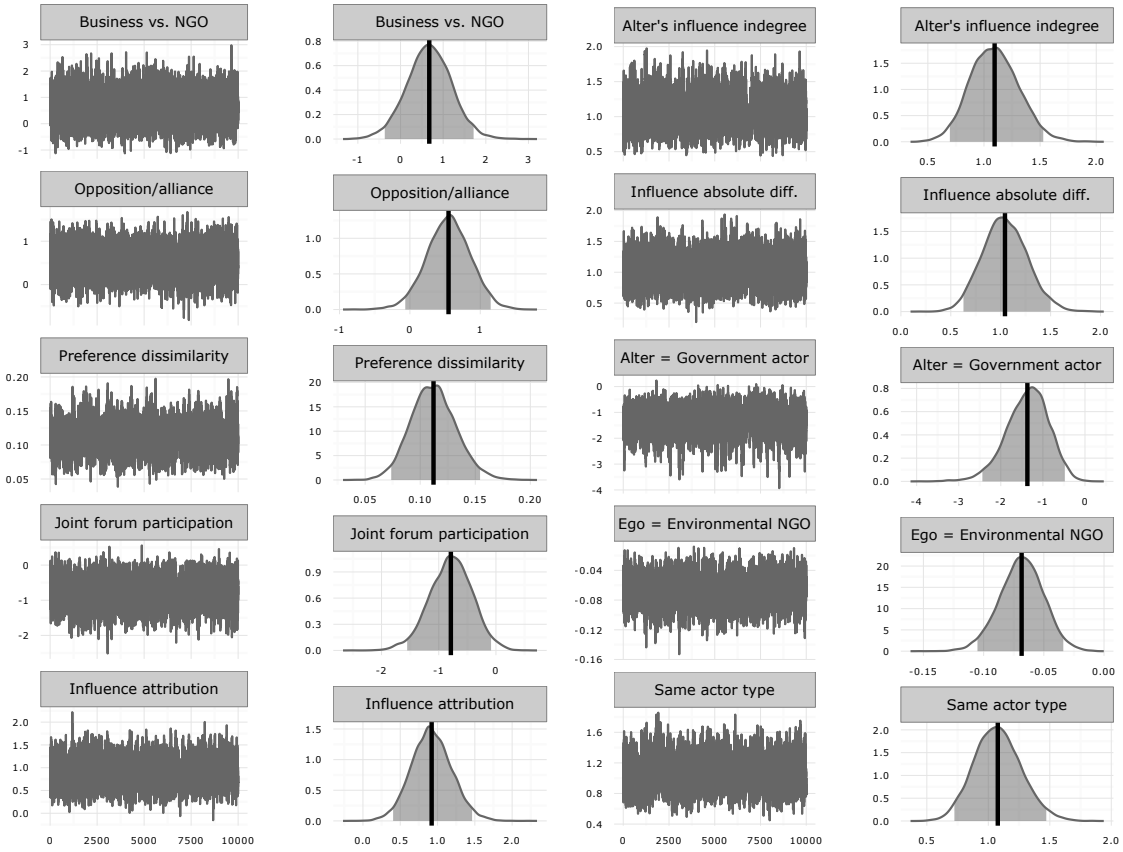

Figure 9. ame convergence

References

Cranmer, Skyler; Philip Leifeld; Scott McClurg & Meredith Rolfe (2016) Navigating the range of statistical tools for inferential network analysis. *American Journal of Political Science*.

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