Appendix 3: Impact of game and article (control) on FCM indices (within-group)

Table A3.1 Impact of game and article on structural indices. Figures in parentheses are standard deviations

	Control (n=20)			Treatment (n=21)		
	Map1	Map 2	p-value	Map 1	Map 2	p-value
Number of concepts	9.15	13.9	0.000*	8.67	11.23	0.000*
	(2.70)	(3.32)		(2.78)	(3.43)	
Number of connections	13.7	26.25	0.000*	11.33	15.81	0.000*
	(5.67)	(9.75)		(5.18)	(6.11)	
Ratio of connections to nodes	1.48	1.86	0.001*	1.31	1.41	0.096
	(0.39)	(0.54)		(0.41)	(0.31)	
Density	0.08	0.03	0.000*	0.11	0.06	0.004*
	(0.07)	(0.04)		(0.09)	(0.03)	
Number of transmitter concepts	1.8	2.3	0.086	1.86	2.62	0.019*
	(1.06)	(1.38)		(1.31)	(1.99)	
Number of receiver concepts	1.95	2.65	0.047*	1.90	2.37	0.366
	(1.67)	(1.87)		(1.39)	(1.68)	
Number of unconnected nodes	0.15	0.30	0.523	0.42	0.42	1.000
	(0.67)	(0.73)		(0.98)	(0.81)	

* $p < 0.05$

Table A3.2 Impact of game and article on centrality for concept categories. Figures in parentheses are standard deviations

Concept Categories	Control (n=20)			Treatment (n=21)		
	Map 1	Map 2	p-value	Map 1	Map 2	p-value
Ice	3.12	4.29	0.1283	2.15	2.95	0.1402
	(1.82)	(2.34)		(1.37)	(2.03)	
Base food chain	0.67	2.64	0.0147*	2.00	2.30	0.7306
	(0.58)	(1.16)		(1.76)	(1.16)	
Mid-level food chain	2.29	4.29	0.0948	1.56	2.06	0.4408
	(1.80)	(2.50)		(1.17)	(0.59)	
Birds	1.84	2.66	0.1900	0.67	0.00	-
	(0.33)	(1.12)		(0.00)	(0.00)	
Mammals	2.06	3.18	0.0241*	1.30	1.43	0.6699
	(1.10)	(1.74)		(0.68)	(0.74)	
Humans in Arctic	3.33	2.85	0.6729	1.67	1.67	1.0000
	(1.76)	(2.07)		(1.30)	(1.07)	
Biodiversity other	2.70	4.04	0.1207	2.85	2.72	0.8511
	(1.48)	(2.20)		(1.54)	(1.87)	
Environmental problems	2.65	3.20	0.0655	2.15	2.42	0.2752
	(1.49)	(1.96)		(1.20)	(1.67)	
Human actions causing environ problems	1.85	2.34	0.1867	1.65	1.97	0.2293
	(0.80)	(1.63)		(1.03)	(0.97)	
Actions to protect Arctic	1.71	2.11	0.3219	2.05	2.06	0.9515
	(1.24)	(1.59)		(1.41)	(1.34)	
Climate system	2.41	3.24	0.1933	2.08	2.56	0.5674
	(1.29)	(1.86)		(0.83)	(1.43)	
Other	1.28	1.57	0.2354	1.87	0.90	0.0752
	(0.39)	(0.46)		(0.87)	(0.81)	

* $p < 0.05$

Table A3.3 Impact of game and article on outdegree for concept categories. Figures in parentheses are standard deviations

Broad Concept	Control (n=20)			Treatment (n=21)		
	Map 1	Map 2	p-value	Map 1	Map 2	p-value
Ice	1.57	2.70	0.0560	1.13	1.61	0.2364
	(1.32)	(1.80)		(0.93)	(1.56)	
Base food chain	0.11	1.15	0.0733	0.89	0.73	0.7523
	(0.19)	(1.22)		(0.84)	(0.73)	
Mid-level food chain	0.67	1.96	0.0674	0.22	0.87	0.1927
	(0.75)	(1.58)		(0.39)	(0.69)	
Birds	0.00	0.00	-	0.00	0.00	-
	(0.00)	(0.00)		(0.00)	(0.00)	
Mammals	0.20	0.53	0.0760	0.03	0.16	0.1598
	(0.39)	(0.64)		(0.10)	(0.26)	
Humans in Arctic	2.08	0.78	0.1051	0.58	0.71	0.7393
	(1.95)	(1.26)		(0.50)	(0.65)	
Biodiversity other	0.78	1.24	0.4918	0.41	0.39	0.9212
	(1.28)	(1.70)		(0.49)	(0.59)	
Environmental problems	1.39	1.70	0.2058	1.09	1.24	0.3985
	(1.25)	(1.60)		(0.91)	(1.22)	
Human actions causing environ problems	1.28	1.63	0.2741	1.06	1.20	0.5494
	(0.71)	(1.45)		(0.95)	(0.82)	
Actions to protect Arctic	1.37	1.68	0.4427	1.30	1.41	0.7005
	(1.15)	(1.58)		(1.15)	(1.22)	
Climate system	1.33	1.81	0.4119	1.92	1.72	0.7848
	(1.26)	(1.68)		(0.83)	(1.24)	
Other	0.72	1.10	0.2723	1.47	0.48	0.0872
	(0.58)	(0.60)		(1.10)	(0.72)	

Table A3.4 Impact of game and article on indegree for concept categories. Figures in parentheses are standard deviations

Broad Concept	Control (n=20)			Treatment (n=21)		
	Map 1	Map 2	p-value	Map 1	Map 2	p-value
Ice	1.55	1.60	0.0432*	1.02	1.35	0.0386*
	(0.69)	(1.00)		(0.80)	(0.97)	
Base food chain	0.56	1.49	0.0633	1.11	1.57	0.0572
	(0.50)	(0.78)		(0.96)	(1.11)	
Mid-level food chain	1.62	2.33	0.0179*	1.33	1.20	0.3861
	((1.38)	(1.39)		(1.25)	(0.96)	
Birds	1.84	2.52	0.2152	0.67	0.00	-
	(0.33)	(1.11)		(0.00)	(0.00)	
Mammals	1.86	2.65	0.0000*	1.27	1.28	0.4302
	(1.02)	(1.39)		(0.68)	(0.78)	
Humans in Arctic	1.25	2.08	0.2349	1.08	0.95	0.3910
	(1.89)	(2.08)		(0.96)	(0.99)	
Biodiversity other	1.93	2.80	0.0054*	2.44	2.33	0.1424
	(1.92)	(1.96)		(1.69)	(2.02)	
Environmental problems	1.25	1.50	0.0000*	1.06	1.18	0.0178*
	(1.25)	(1.01)		(0.80)	(0.98)	
Human actions causing environ problems	0.58	0.71	0.1342	0.59	0.77	0.0222*
	(0.59)	(0.66)		(0.61)	(0.71)	
Actions to protect Arctic	0.35	0.44	0.0573	0.75	0.65	0.5912
	(0.54)	(0.55)		(0.89)	(0.77)	
Climate system	1.08	1.43	0.1234	0.17	0.84	0.2517
	(0.74)	(0.42)		(0.34)	(0.84)	
Other	0.56	0.48	-	0.40	0.43	0.8170
	(0.95)	(1.32)		(0.59)	(0.57)	

* $p < 0.05$