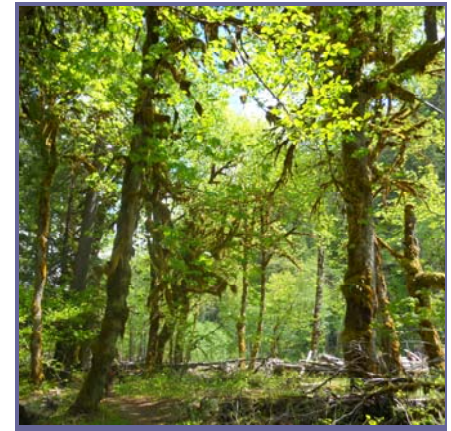


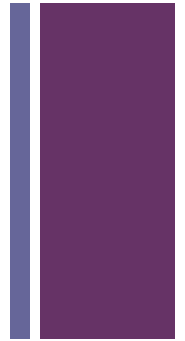
**Tyler Scott
Craig Thomas**

**Evans School of Public Affairs
University of Washington**



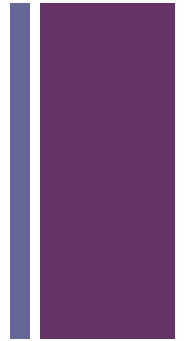
The Effect of Collaborative Partnerships on Inter-organizational Networks

Theoretical Rationale



- The policy literature now contains well-developed theoretical frameworks that describe:
 - Inter-organizational networks (Provan and Kenis 2008; Klijn et al. 2010)
 - Collaborative governance (Ansell and Gash 2008; Emerson et al. 2012)
- There is much less work on the nested relationship between collaborative governance and networks (Margerum 2011)

Theoretical Rationale



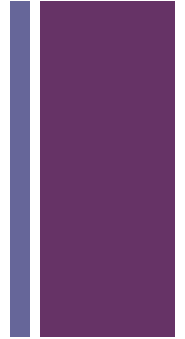
- Collaboration sometimes happens spontaneously, but it is often the product of purposeful effort by policy makers (Ansell & Gash 2008; Koontz, et al. 2004)
- The creation of collaborative partnerships can therefore be viewed as a policy tool for altering the structure and function of service delivery networks
- In order to use collaborative groups effectively as a policy tool, evidence is needed about the impacts of collaborative groups on network ties

Theoretical Rationale



- We know a lot about how collaborative groups affect network ties amongst group members (e.g., Lubell 2004):
 - Enhance learning/information sharing (e.g., Leach et al. 2013)
 - Foster trust amongst members (e.g., Lubell 2007)
 - More comprehensive/creative policies and practices (e.g., Connick and Innes 2003)
- We know little about the marginal impact of a new collaborative group on network ties overall (Lubell et al. 2010):
 - How does a collaborative group change an existing network?
 - When is support for new collaborative groups redundant?
 - What are the group mechanisms for network change?

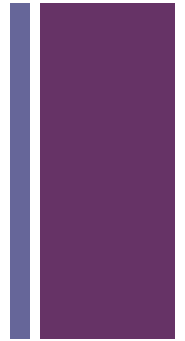
Research Design



- **Case: Puget Sound region, Washington State**
 - State legislature forms state agency, “Puget Sound Partnership” (PSP) to promote collaboration
 - The PSP initiates and/or sponsors 34 local and regional collaborative groups for environmental protection
 - However, many collaborative groups already existed in the region
 - Our sample frame: 1000 individuals who are members of 34 PSP-sponsored and 23 other collaborative groups in Puget Sound region

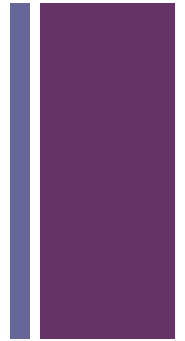
- **Online survey instrument to generate data on:**
 - Type and extent of group participation
 - Perceived effects of group participation
 - Different types of organizational network ties (e.g., planning vs. joint implementation)

Data and Analysis



- 400 responses (40% response rate), 226 unique organizations
- OLS cannot be used because data are relational (i.e., not independent)
- We therefore use Exponential Random Graph Models (ERGMs) to conduct organizational network
 - Simulate thousands of hypothetical network graphs based upon observed characteristics of our network data
 - Compare observed network to simulated distribution
 - Fit parameters to model dependencies amongst observations
 - Estimate probability of observing a network tie between two organizations (observed value 0 or 1, much like a logit model)

Data and Analysis: Hypothesis 1



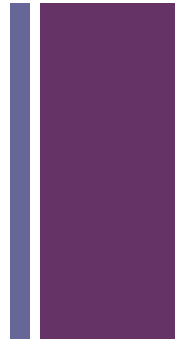
- Hypothesis 1: *Shared group activity level with a given organization is positively related to the likelihood of reporting a network tie with that organization.*
- Policy implication: Does state sponsorship and support of a collaborative group actually enhance network ties among members of the group?
- How we test: Measure 7 types of group participation (e.g., attend group meetings), and assign each pairwise combination of organizations a shared participation score based upon membership and participation level
 - Score: No Shared Activity → 0, Limited Shared Activity → 1-7, Moderate Shared Activity → 8-14, Significant Shared Activity → 15+

Data and Analysis: Hypothesis 1

	Model 0	$\exp(\beta_i)$	Model 1	$\exp(\beta_i)$
<i>(Structural Parameters)</i>				
edges	-4.87***	0.01	-4.78***	0.01
mutual	2.50	12.18	2.21	9.12
Twopath	-0.07*	0.93	-0.07*	0.93
Ctriple	-0.02	0.98	-0.39	0.68
GWIDegree ($\alpha=\ln(2)$)	-3.89***	0.02	-3.58***	0.03
GWODegree ($\alpha=\ln(2)$)	-0.34	0.71	-0.01	0.99
GWESP ($\lambda=2$)	1.14**	3.13	0.99***	2.69
<i>(Covariates)</i>				
# of Responses from each Organization	0.21*	1.23	0.17*	1.19
# of Group Memberships	0.02	1.02	-0.03	0.97
Shared Group Activity Level (0 to 3)			1.03***	2.80
Bayesian Information Criterion (BIC) :				
	4201.5		3994.1	

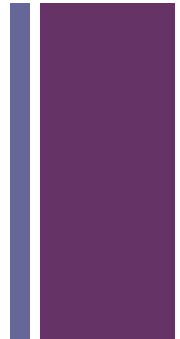
One-category increase in shared group activity (e.g., none to limited) increases the probability of a network tie by 180%, everything else held constant.

Data and Analysis: Hypothesis 2



- Hypothesis 2: *Participation in external collaborative groups (i.e., those that are not initiated or supported as part of a state-sponsored network intervention) decreases the effect of co-membership in a state-sponsored group on the likelihood of reporting a network tie with another member of a state-sponsored group.*
- Policy implication: When is further support for collaborative groups redundant? Do additional groups make a difference?
- How we test: (1) Test interaction of shared participation score for pre-existing groups and shared participation score for PSP-sponsored groups; (2) Test extent to which membership in any pre-existing group mitigates effect of shared participation in PSP-sponsored group.

Data and Analysis: Hypothesis 2



	Model 3	Model 4	Model 5
<i>(Structural Parameters)</i>			
edges	-5.16***	-5.21***	-5.23***
mutual	2.04	1.70	1.36
twopath	-0.06	-0.04	-0.04
ctriple	-0.03	-0.28	-0.28
GWIDegree ($\alpha=\ln(2)$)	-3.64***	-3.70**	-3.96**
GWODegree ($\alpha=\ln(2)$)	-0.02	0.07	0.09
GWESP ($\lambda=2$)	1.01***	0.97*	1.01***
<i>(Covariates)</i>			
# of Responses from each Organization	0.18**	0.15	0.14
# of Non-PSP Groups	-0.01	0.01	-0.01
Non-PSP Shared Group Activity Level	0.67**	0.73*	0.97*
PSP Shared Group Activity Level	0.96***	1.25**	1.44**
# Non-PSP Groups * PSP Shared Group Activity Level		-0.03	
Non-PSP Shared Activity Level * PSP Shared Activity Level			-0.55
BIC:	3977.8	3958.1	3929.7

- Insignificant, but negative effect:
 $\exp(-0.03) = 0.97$
- An increase of one non-PSP group decreases predicted impact of shared activity in PSP group by 3%

Data and Analysis: Hypothesis 2

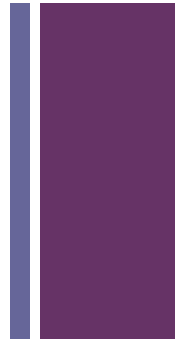
	Model 3	Model 4	Model 5
<i>(Structural Parameters)</i>			
edges	-5.16***	-5.21***	-5.23***
mutual	2.04	1.70	1.36
twopath	-0.06	-0.04	-0.04
ctriple	-0.03	-0.28	-0.28
GWIDegree ($\alpha=\ln(2)$)	-3.64***	-3.70**	-3.96**
GWODegree ($\alpha=\ln(2)$)	-0.02	0.07	0.09
GWESP ($\lambda=2$)	1.01***	0.97*	1.01***
<i>(Covariates)</i>			
# of Responses from each Organization	0.18**	0.15	0.14
# of Non-PSP Groups	-0.01	0.01	-0.01
Non-PSP Shared Group Activity Level	0.67**	0.73*	0.97*
PSP Shared Group Activity Level	0.96***	1.25**	1.44**
# Non-PSP Groups * PSP Shared Group Activity Level		-0.03	
Non-PSP Shared Activity Level * PSP Shared Activity Level			-0.55
BIC:	3977.8	3958.1	3929.7

- Insignificant, but negative effect:

$$\exp(-0.55) = 0.58$$

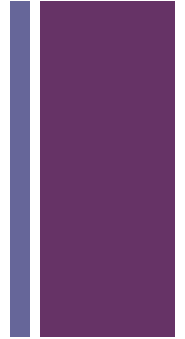
- A one category increase in shared non-PSP group activity decreases predicted impact of shared activity in PSP group by 42%

Data and Analysis: Hypothesis 3



- Hypothesis 3: *Organizations that report an increase in principled engagement and capacity for joint action stemming from their participation in a collaborative group are more likely to report a network tie with other group members.*
- Policy implication: What should collaborative groups strive to be/create? (e.g., information-sharing forum? “meet-and-greet”?)
- How we test: Are organizations that report that their group participation has increased their *principled engagement* or *capacity for joint action* with other organizations more likely to report a network tie with another group member?

Data and Analysis: Hypothesis 3



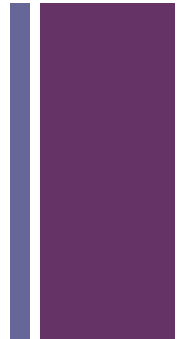
■ Principled Engagement

- (1) increased their awareness of the interests and values of other organizations
- (2) increased the amount of face-to-face communication they engage in with other organizations
- (3) increased their understanding of commonly used language in the field

■ Capacity for Joint Action

- (1) increased awareness of and/or access to scientific, technical, or policy-specific information
- (2) increased access to human resources such as administrative support or IT services
- (3) increased access to financial resources such as grant opportunities

Data and Analysis: Hypothesis 3



	Model 6	Model 7	Model 8
<i>(Structural Parameters)</i>			
edges	-5.70***	-5.87***	-5.55***
mutual	-2.36	-3.15*	-2.14*
twopath	-0.07***	-0.07	-0.07***
ctriple	-0.19	-0.18	-0.22
GWIDegree ($\alpha=\ln(2)$)	-4.12***	-3.66***	-4.40***
GWODegree ($\alpha=\ln(2)$)	0.01	0.19	0.01
GWESP ($\lambda=2$)	0.74***	0.81***	0.79*
<i>(Covariates)</i>			
# of Responses from each Organization	0.22*	0.23***	0.23***
# of Group Memberships	0.01	-0.01	-0.02
Shared Group Activity Level	-0.01	-0.03	0.05
Face-to-Face Communication	1.72***		
Awareness of Interests and Values		1.81***	
Understanding of Common Language			1.82***
BIC:	2046.0	2030.9	2124.8

- Highly significant, positive:

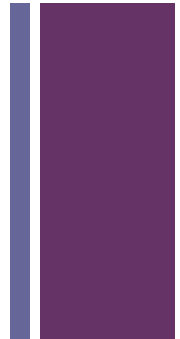
$$\exp(1.72) = 5.58$$

$$\exp(1.81) = 6.11$$

$$\exp(1.82) = 6.17$$

- One scale-point increase increases likelihood of tie with other group member by 458% to 517%

Data and Analysis: Hypothesis 3



	Model 9	Model 10	Model 11
<i>(Structural Parameters)</i>			
edges	-5.55***	-5.38***	-5.48***
mutual	-2.82*	-0.82	-1.98*
twopath	-0.07***	-0.06***	-0.03***
ctriple	-0.23	-0.10	-0.10
GWIDegree ($\alpha=\ln(2)$)	-3.85***	-4.77***	-4.90***
GWODegree ($\alpha=\ln(2)$)	0.18	0.34	0.36
GWESP ($\lambda=2$)	0.81***	0.87***	0.75****
<i>(Covariates)</i>			
# of Responses from each Organization	0.19***	0.16***	0.15*
# of Group Memberships	-0.01	-0.01	-0.01
Shared Group Activity Level	-0.09	0.34***	0.16
Access to Information	1.82***		
Access to Human Resources		1.95***	
Access to Financial Resources			1.79***
BIC:	2022.6	2475.4	2276.9

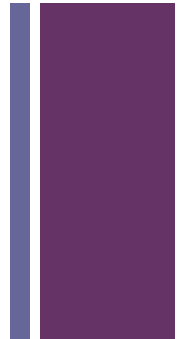
- Highly significant, positive:

$$\begin{aligned} \exp(1.82) &= 6.17 \\ \exp(1.95) &= 7.03 \\ \exp(1.79) &= 5.99 \end{aligned}$$

- One scale-point increase increases likelihood of tie with other group member by 499% to 603%

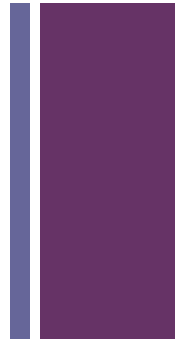
Discussion

- Reject null for Hypothesis 1: Collaborative groups do appear to influence network structure and function, as shared group activity level is highly predictive of network ties.
 - By strategically involving specific organizations and motivating participation in group activities, policy makers can enhance collaboration amongst network organizations
- Fail to reject null for Hypothesis 2: Unable to demonstrate diminishing returns to collaborative group support.
 - But, estimates are negative, as we hypothesize
 - Policy-makers should consider whether collaborative groups represent new opportunity, or are redundant and offer less benefit



Discussion

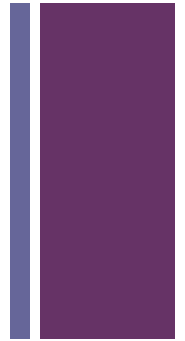
- Reject null for Hypothesis 3: Collaborative groups that foster principled engagement and conduct activities that facilitate joint action increase the prevalence of network ties (representing different types of collaborative activity) amongst participating organizations
- Speaks to causal mechanisms by which state sponsorship of collaborative groups can affect an organizational network
- Policy makers seeking to foster inter-organizational networks should emphasize building social-capital amongst organizations and helping organizations access resources



Thank You

Tyler Scott & Craig Thomas

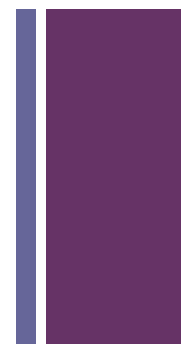
**Evans School of Public Affairs
University of Washington**



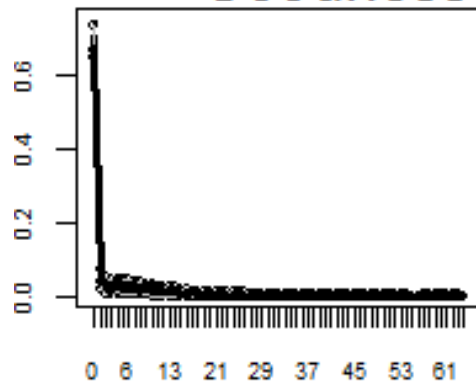
Structural Model Term Definitions

Term	Definition	Example ($A \rightarrow B$ if $Y_{AB} = 1$)
edges	Measure of overall density: reflects baseline probability of a network tie	$P(A \rightarrow B)$
mutual	Change in probability if the other organization has already reported a tie between said pair	$\Delta P(A \rightarrow B) B \rightarrow A$
twopath	Reflects number of organizations connected via two edges. Measure of network connectivity.	# structures where $A \rightarrow B$ & $B \rightarrow C$
ctriple	Reflects number of cyclic triangles. Measure of closure.	# structures where $A \rightarrow B$, $B \rightarrow C$, & $C \rightarrow A$
GWIDegree ($\alpha = \ln(2)$)	Weighted distribution of “in-degrees,” or ties reported TO an organization (α is weight, which de-emphasizes high-degree nodes)	A is of in degree 2 if $B \rightarrow A$ & $C \rightarrow A$
GWODegree ($\alpha = \ln(2)$)	Weighted distribution of “out-degrees,” or ties reported FROM an organization (α is weight, which de-emphasizes high-degree nodes)	A is of out degree 2 if $A \rightarrow B$ & $A \rightarrow C$
GWESP ($\lambda = 2$)	Geometrically-weighted edgewise shared partners: Weighted distribution of number of shared partners for organizations that share an edge. $\lambda =$ weight	A and B have 1 edgewise shared partner if $[A \leftarrow B \text{ or } A \rightarrow B]$ & $[A \leftarrow C \text{ or } A \rightarrow C]$ & $[B \leftarrow C \text{ or } B \rightarrow C]$

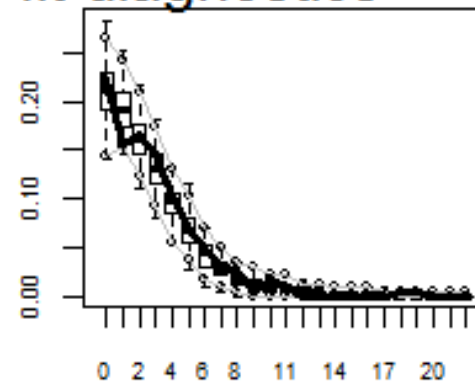
Testing for Model Degeneracy



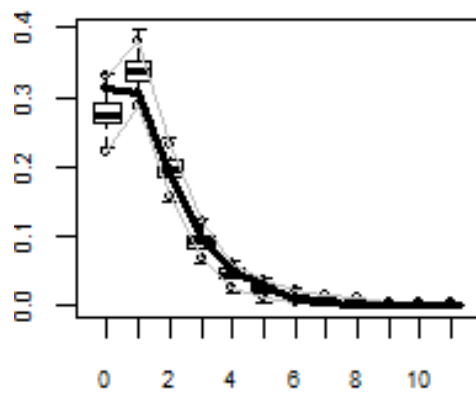
Goodness-of-fit diagnostics



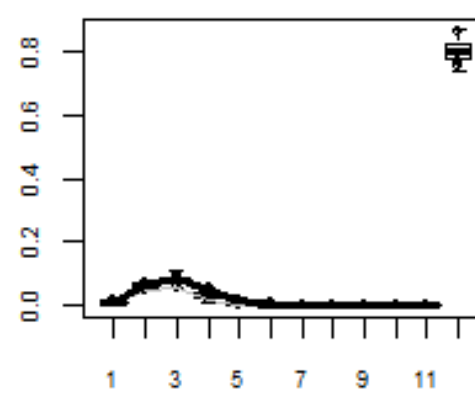
in degree



out degree

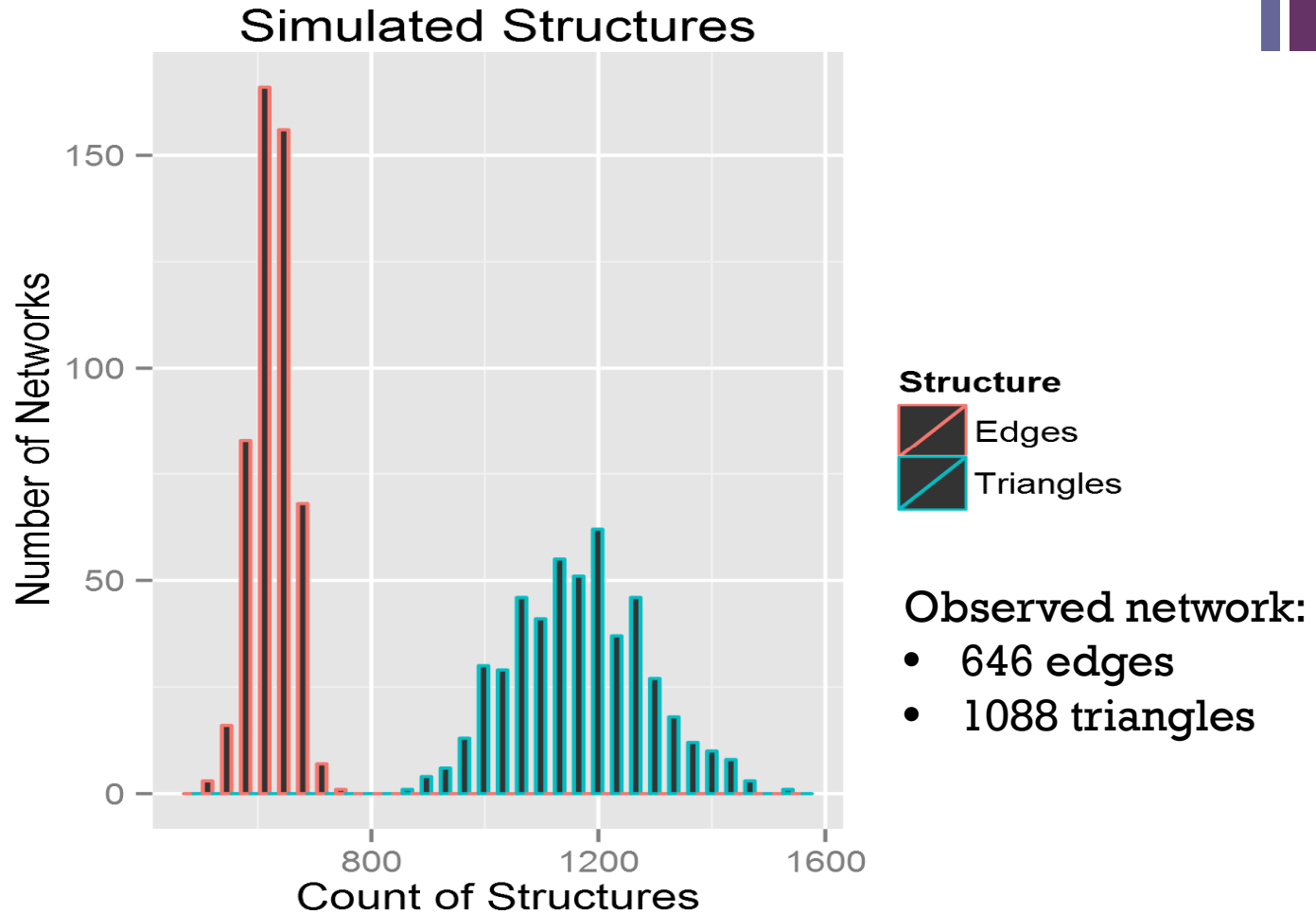
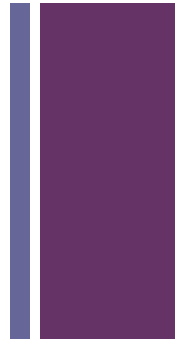


edge-wise shared partners

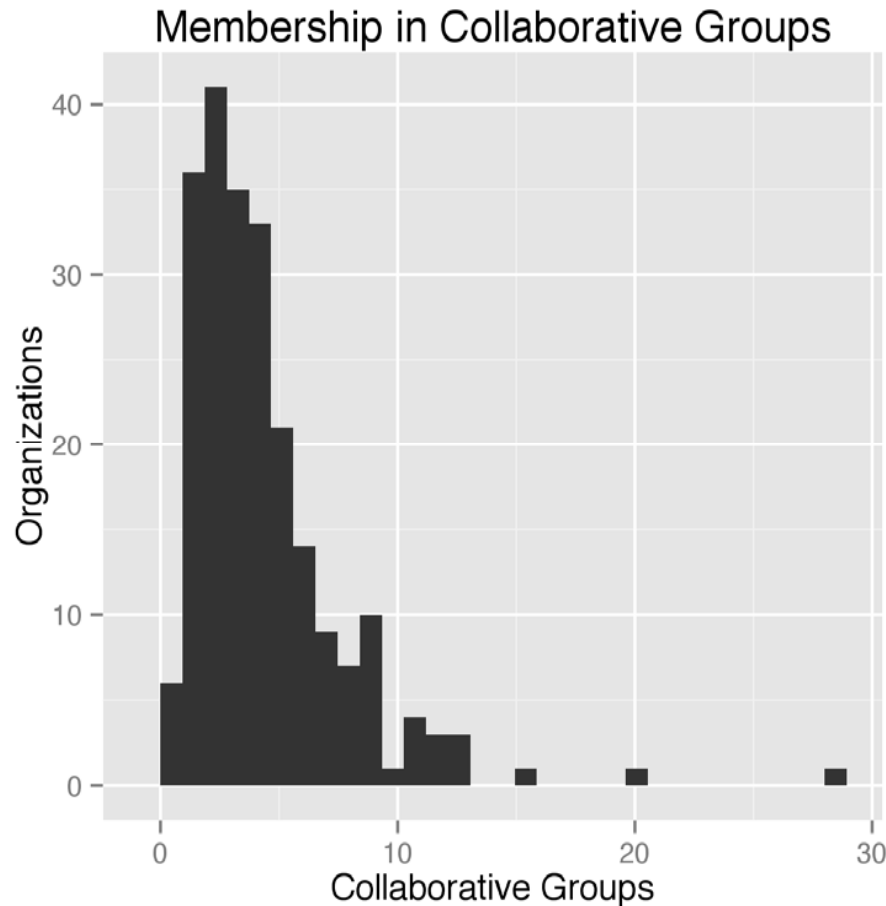
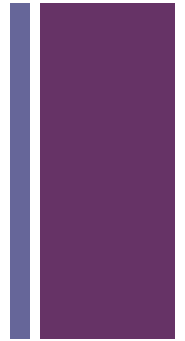


minimum geodesic distance

Distribution of Simulated Structures



Number of Groups by Organization



- Large degree of group participation
- Most respondents participate in **AT LEAST** two collaborative groups, many a great deal more.

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