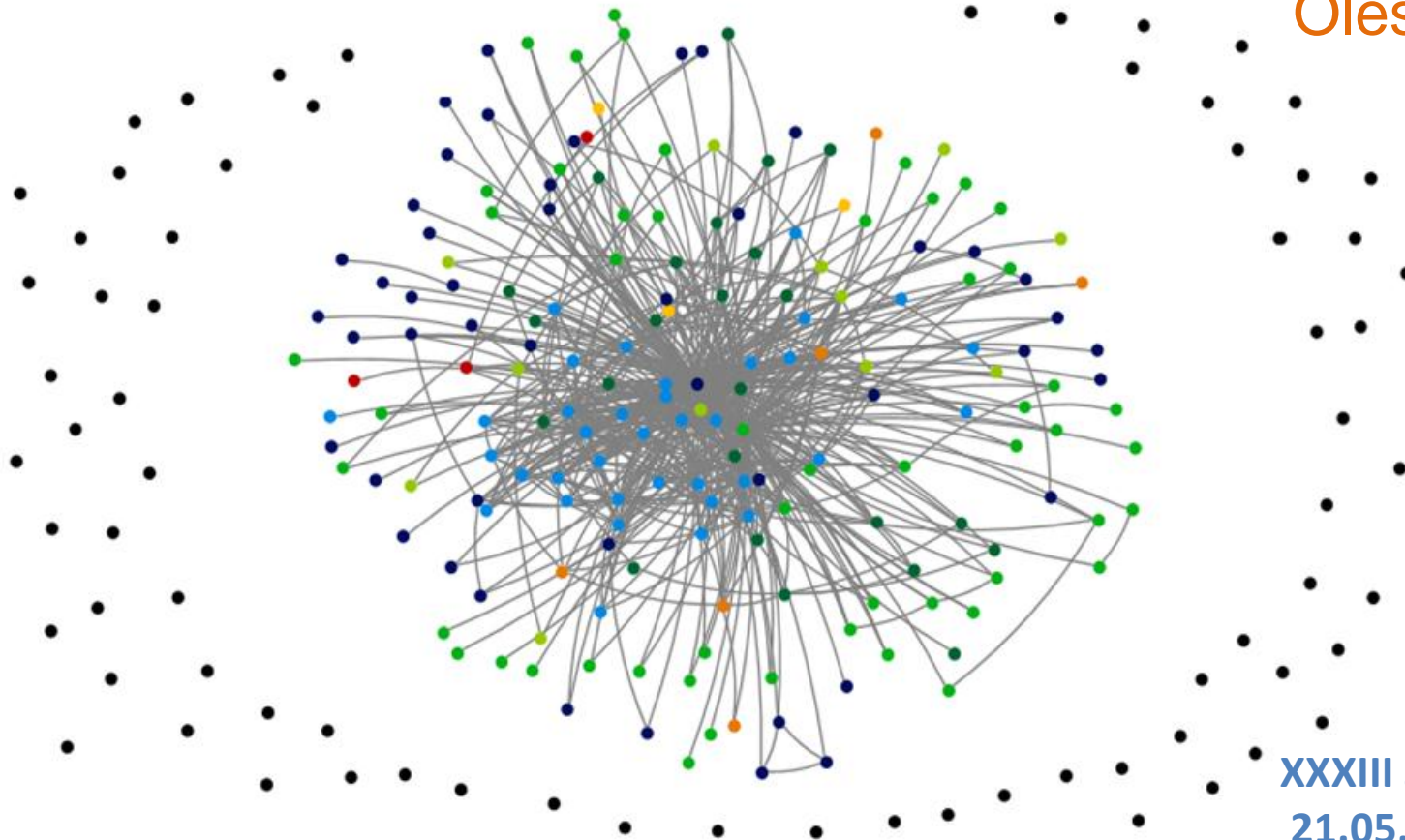# "Friendship" networks and leadership in online social movement communities:
A comparison of election observers' groups in a Russian social networking site

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XXXIII Sunbelt, Hamburg
21.05.2013 – 26.05.2013

Total = 17 online communities in social networking site "Vkontakte" of social movement "St. Petersburg Observers"

"Friendship" networks

"Friendship" and **community membership** are independent options in the Vkontakte SNS.

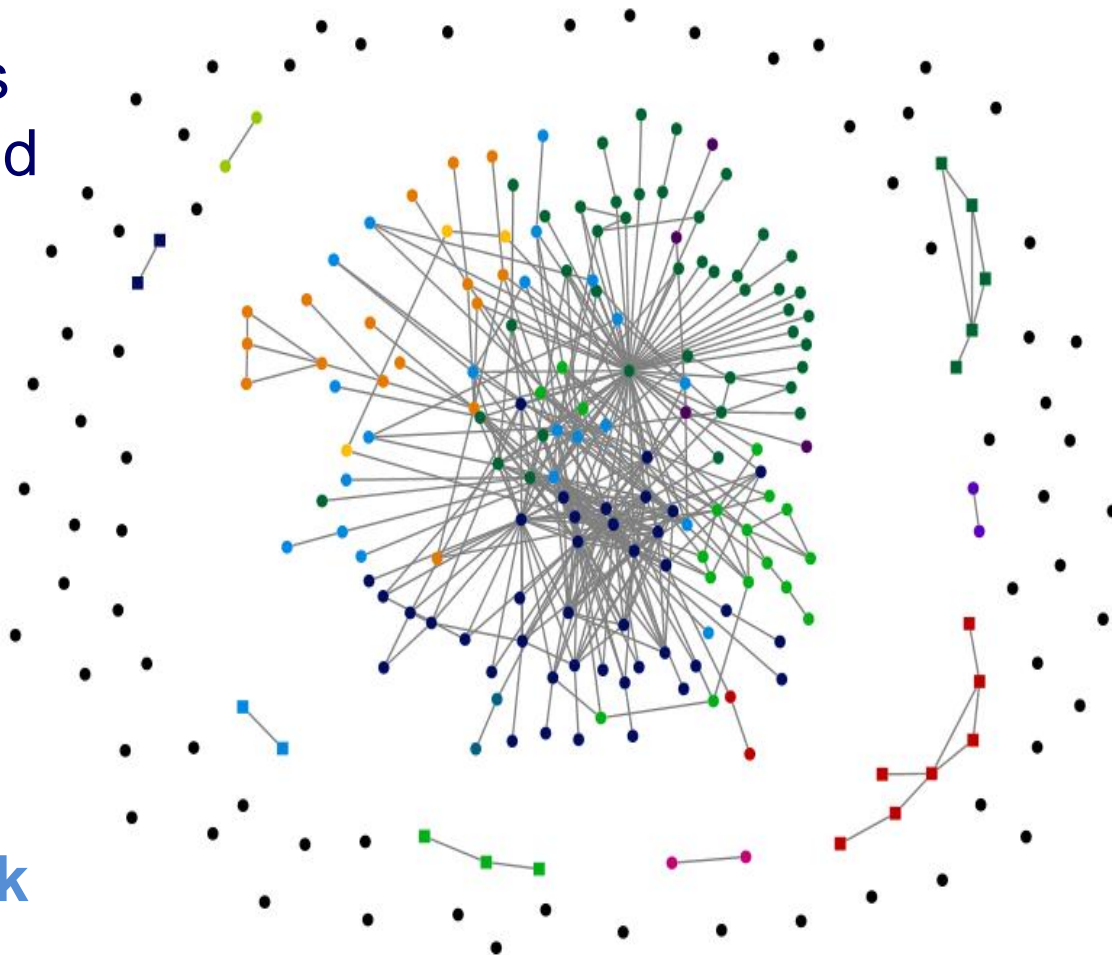**Focus on: "friendship" relations between members of an online community.**

"Friendship" network within online community is hidden social structure that may affect the information diffusion, support and mobilize members for collective action.

Research goals

1. To **compare** "friendship" networks and identify similarities and differences of its structure.

2. To **identify dependence** between topological features and level of communication activity or population of community.

3. To identify **moderators** in "friendship" network and compare their positions

Network Model & Basic Notions

- Nodes = users (community member)

- Links = "friendship" relations

- Leaders: moderators with editing rights and off-line coordination functions.
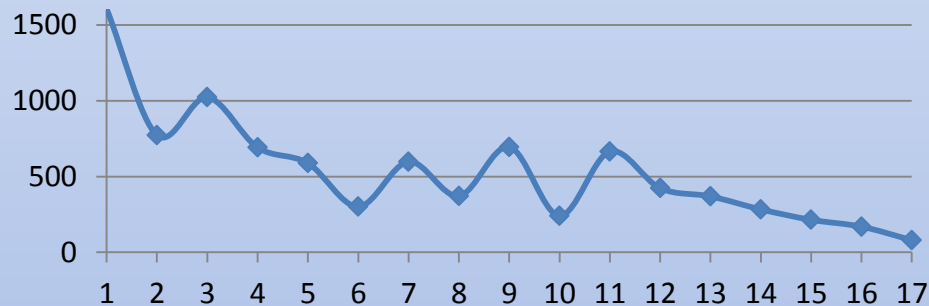
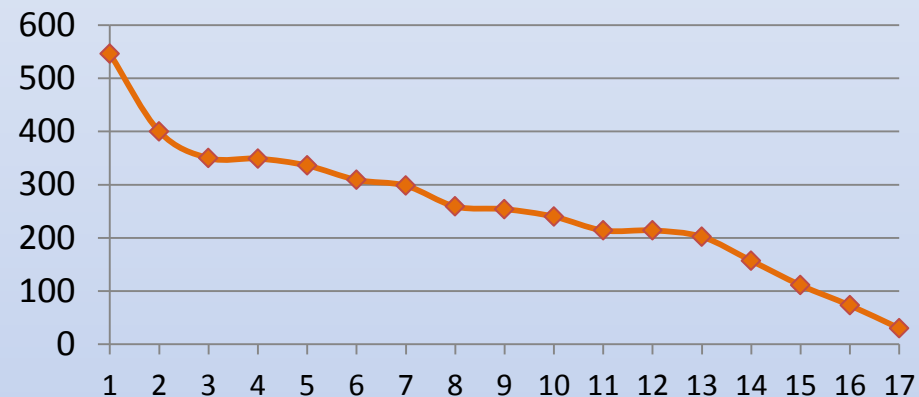- Communication: posts, messages, comments, likes

Vyborgsky district "friendship" network

Preliminary data:

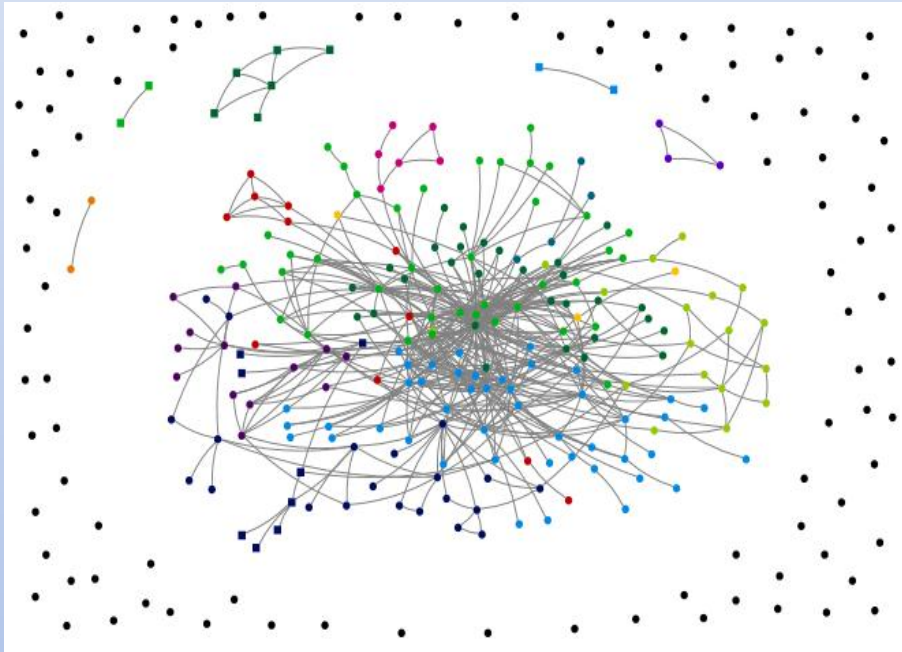## Population and level of communication activity of communities

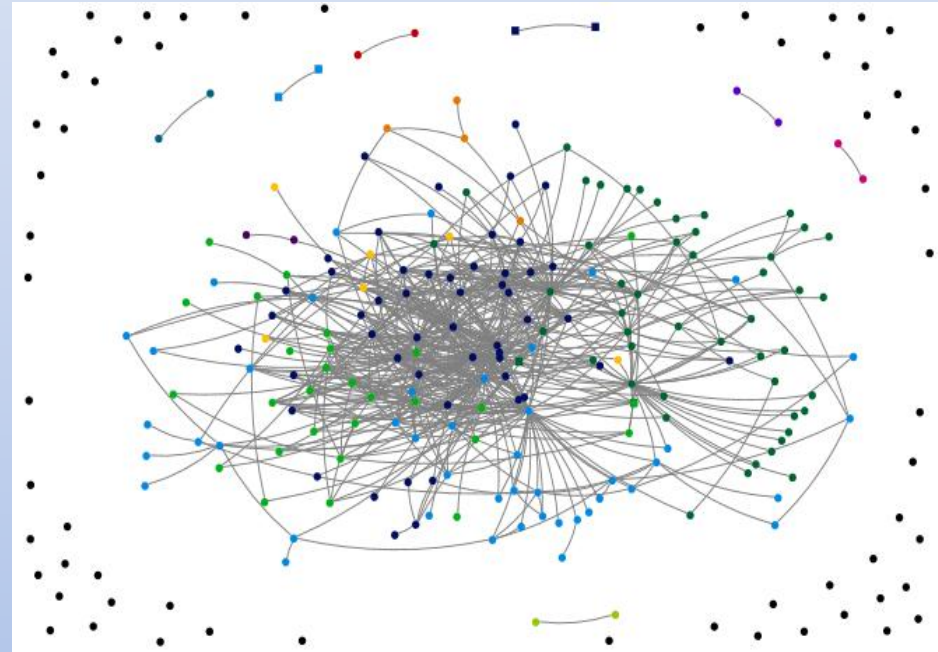| District communities	Population	Total posts	Posts per user
1. Pushkin	546	1606	0.337
2. Primorsky	400	773	0.998
3. Vasilyevsky	350	1023	0.897
4. Admiralteysky	349	692	1.493
5. Kirovsky	336	588	0.116
6. Kalininsky	309	301	0.434
7. Nevsky	298	598	0.846
8. Centralny	259	372	0.880
9. Krasnoselsky	254	695	1.146
10. Vyborgsky	240	241	0.304
11. Petrogradsky	214	665	1.542
12. Moskovsky	214	423	1.187
13. Krasnogvardeysky	202	369	0.767
14. Frunzensly	157	283	1.051
15. Petrodvorets	111	214	0.631
16. Kolpinsky	73	169	2.082
17. Kurortny	30	80	2.200

How to compare these networks?

Kalininsky district

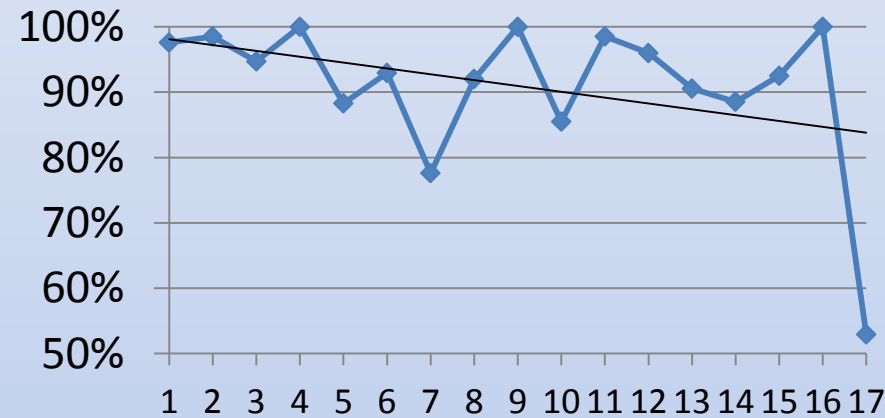**Centralny district**
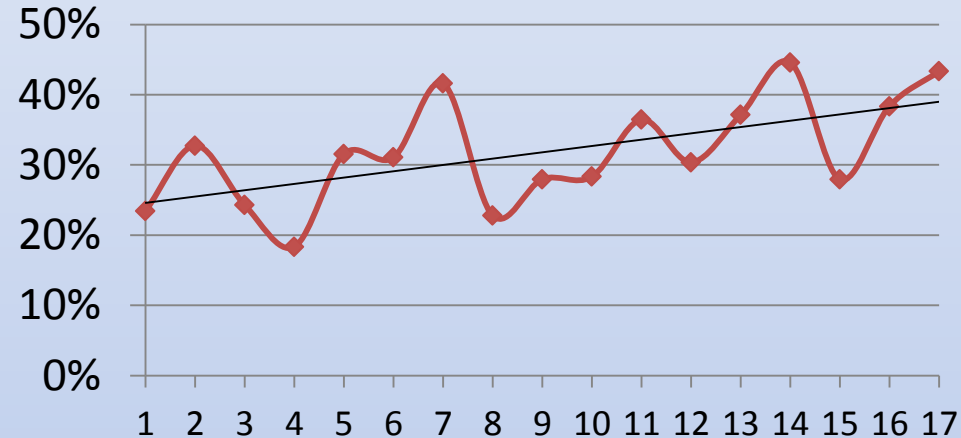

1. Macro structures of network – connected components
2. Middle structures of network – clusters (results of community detection algorithms)

Comparison of networks

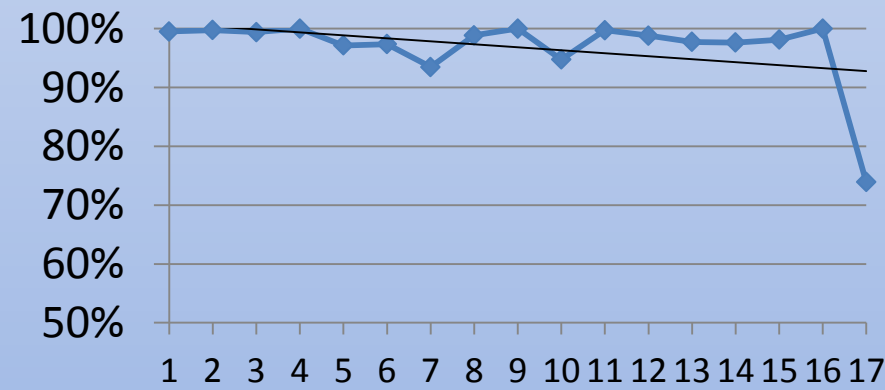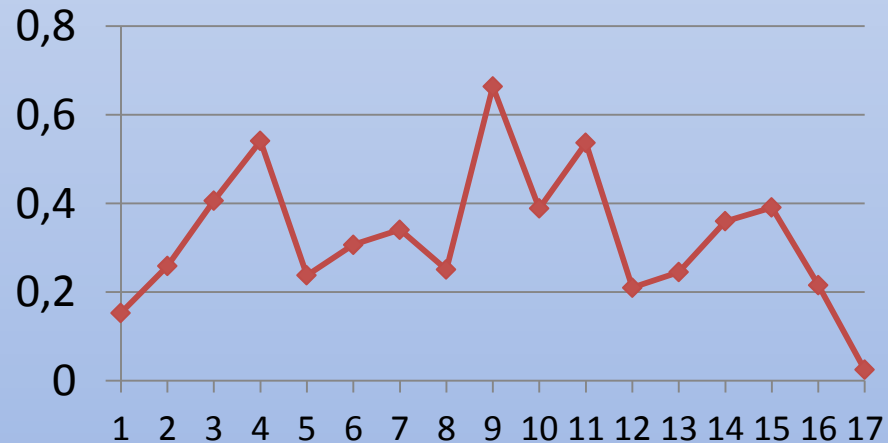**Proportion of nodes in the largest connected component**

Proportion of isolates

Proportion of edges in the largest connected component
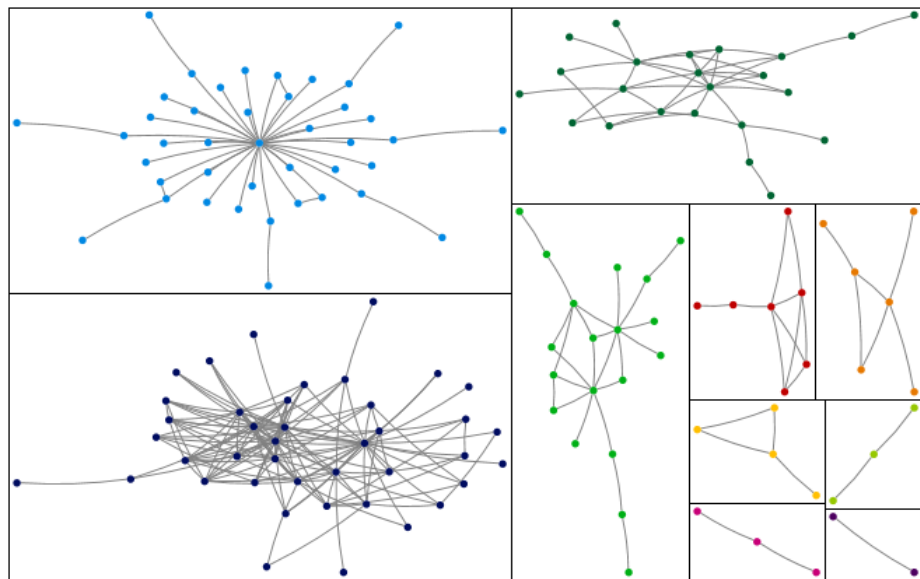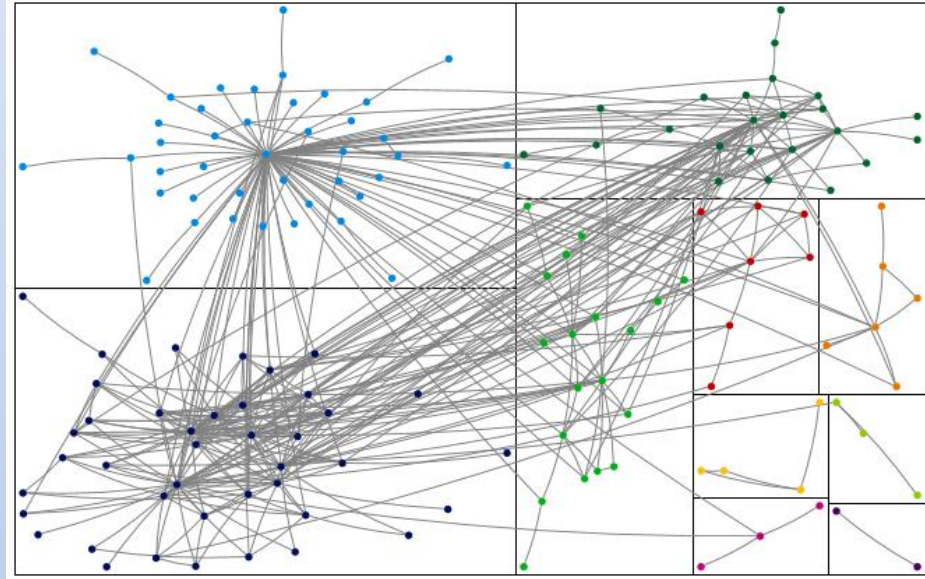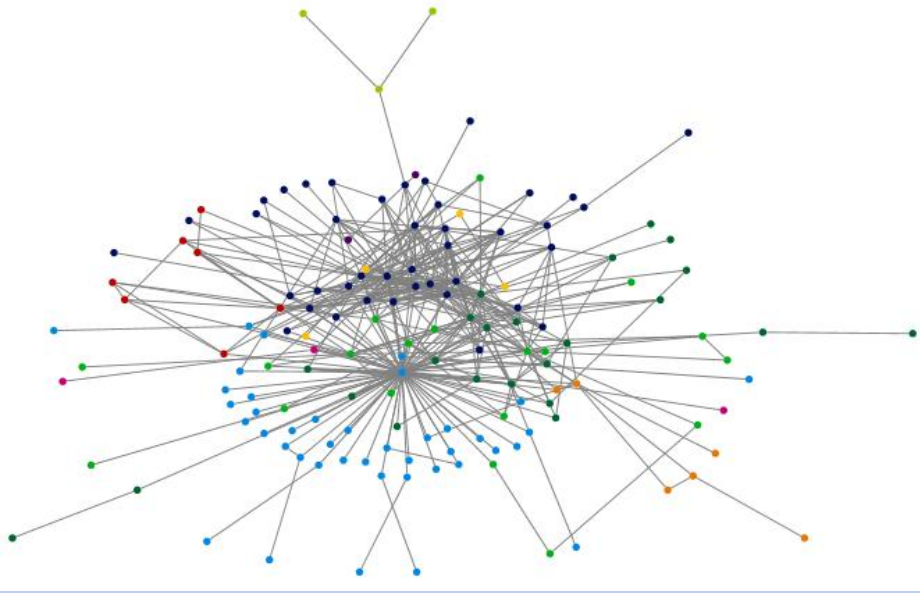

Degree centralization

Relatively constant proportion of isolates + connected nodes tend to unite into single core

Comparison of networks

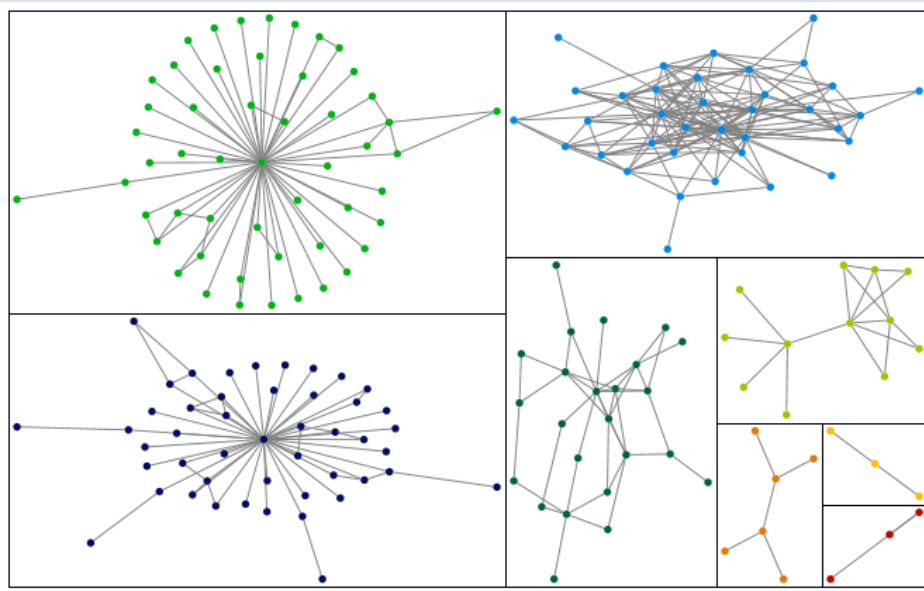## Cluster topology: the case of Moskovsky district

More & less unequal degree distribution within clusters = different topological types

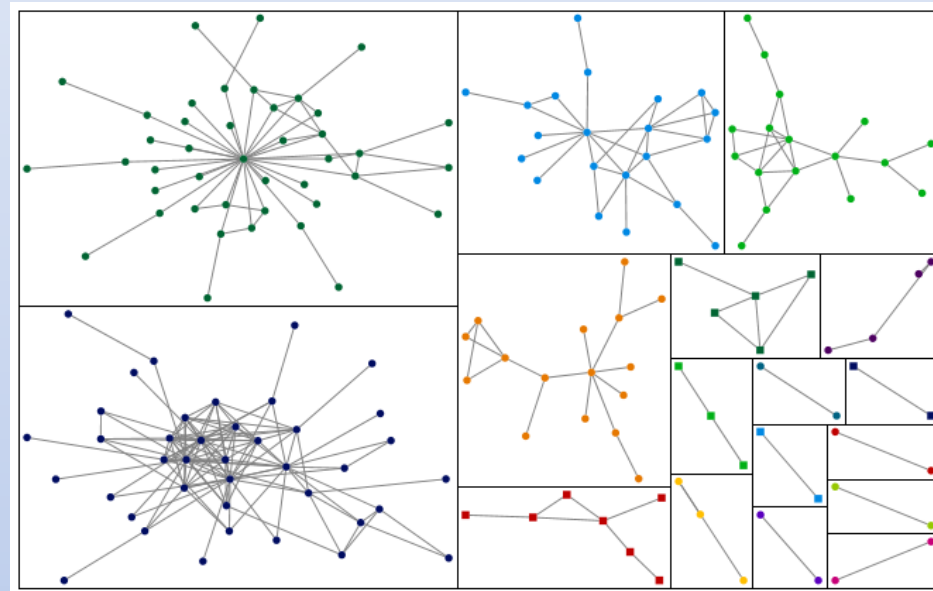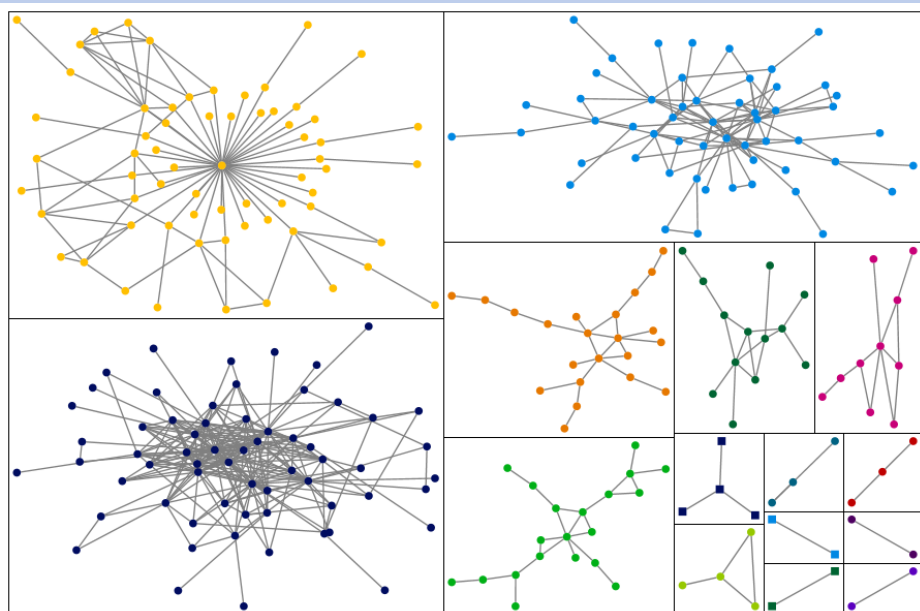**Community detection algorithm: Clauset-Newman-Moore**

Comparison of networks

Krasnoselsky district

Vyborgsky district

Primorsky district

- **Stars and tight sub communities**
- **9 different communities have similar network topology**

Communication activity & networks

1. **Aggregate user's communication activity and network characteristics**
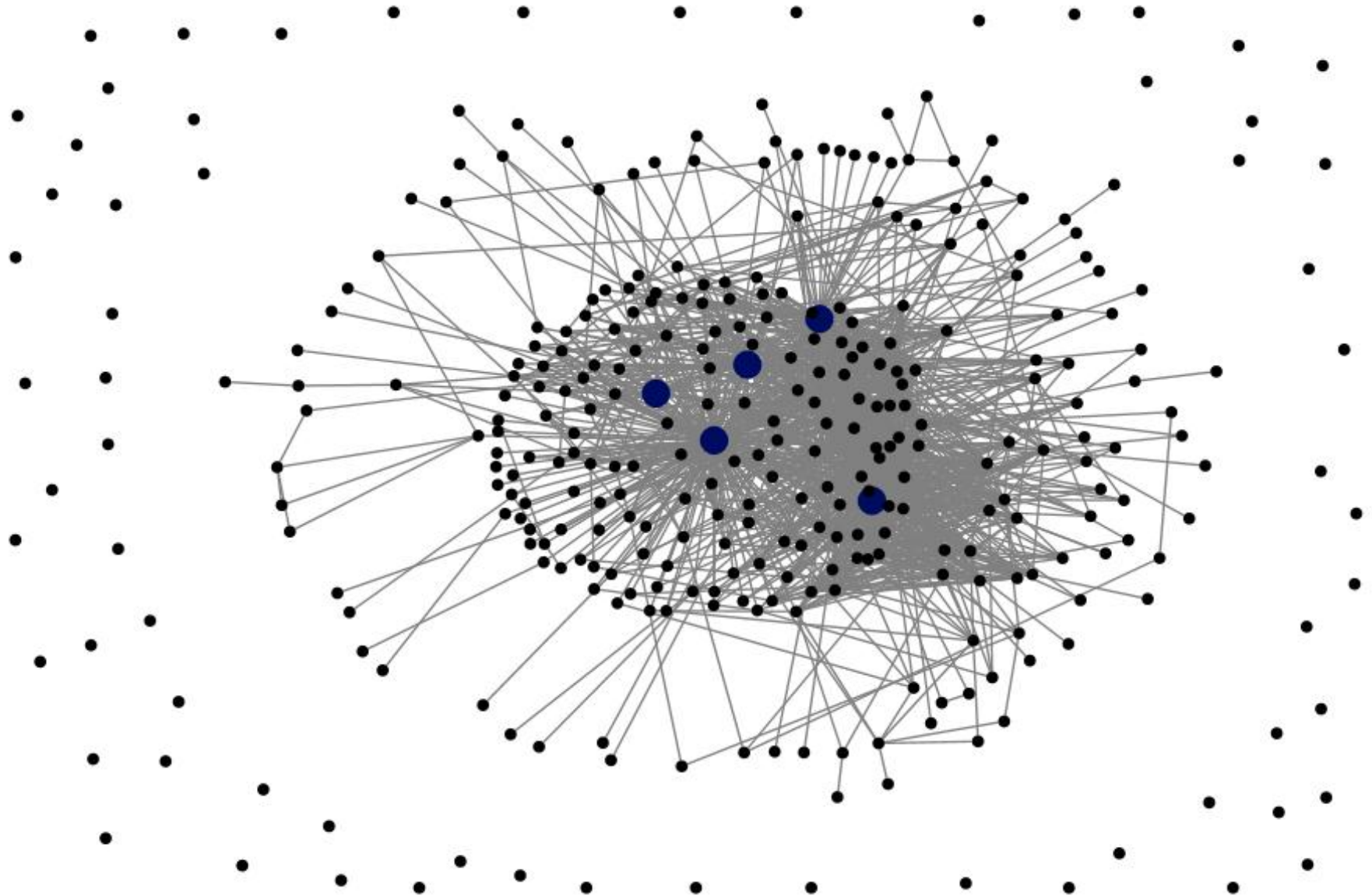
Correlation	Number of clusters	Density without isolates	Proportion of nodes in the largest cluster
Number of posts per user	**- 0.743**	**0.747**	**0.788**

2. **User's centrality and communication activity: the case of Moskovsky district**

Correlation	Posts	Received comments	Received likes	Reposts	Messages	Comments
Degree centrality	**0.58**	0.3	**0.64**	**0.68**	0.35	0.2
Betweenness centrality	**0.53**	0.3	**0.75**	**0.93**	0.42	0.22

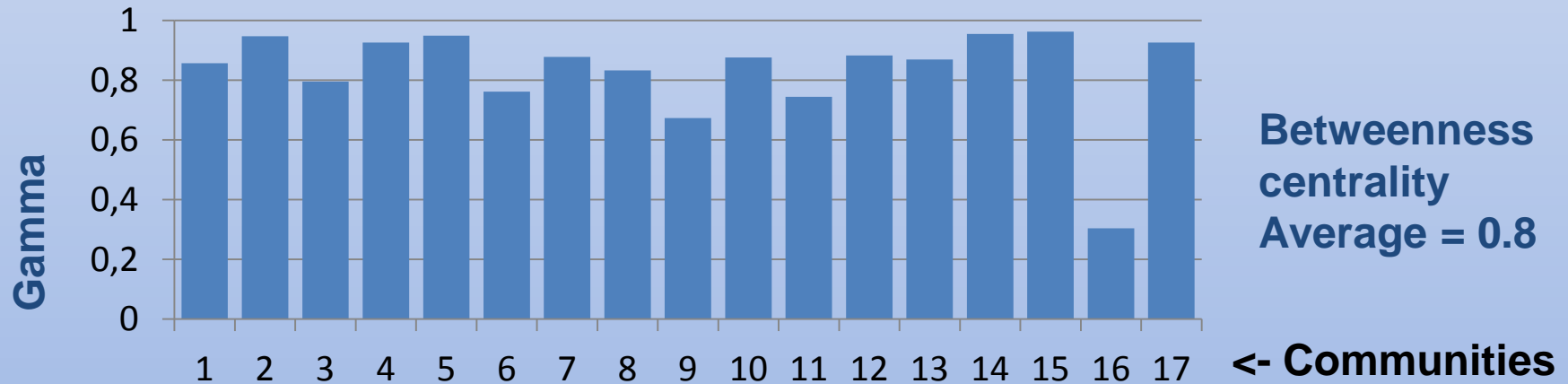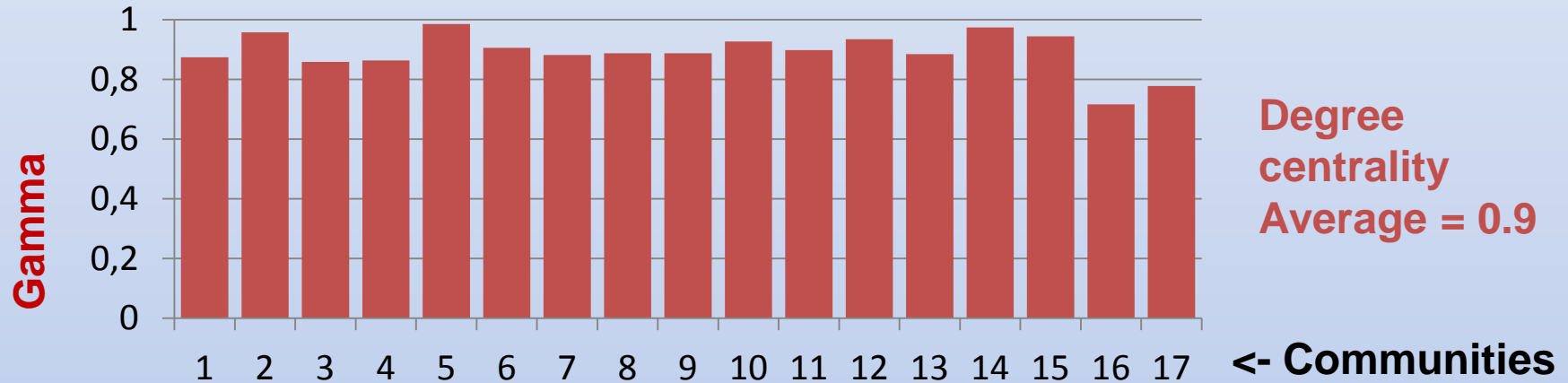**Communication shapes a "friendship" network?**

Community moderators in network

Admiralteysky district

Moderators & centrality

5. **Centrality and user's status (moderator or ordinary user) (Gamma measure of association)**

Gamma

Degree centrality Average = 0.9

<- **Communities**

Betweenness centrality Average = 0.8
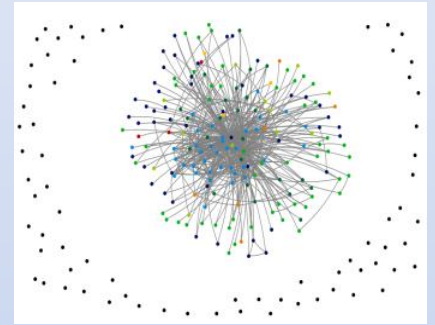
<- **Communities**

=> **Strong association** between user's status and centrality measures

Conclusions

1. **In all communities:**
   connected nodes tend to unite into single core + relatively constant proportion of isolates

2.1. **Aggregated communication activity of members on the main page is related to the tightness of their friendship**

2.2. **Individual communication activity positively correlates with user's centrality**

3. **Community moderators are more central than ordinary members in the networks of friendship**

Thanks for your attention!