

AIDS Dissident Virtual Community in "VK" SNS: Perspectives for Quantitative Study of Social Structure

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This explorative paper aims at demonstrating possibilities of quantitative approach in sociology, including social network analysis, to the study of online communities in social networking services. The object of this study is the largest online group representing the movement and ideology of AIDS dissidents in the most popular Russian SNS «VKontakte». This group counts about 13,000 member users and about 70,000 instances of communication via posts, comments and “likes”. The general and initial goal of quantitative part of this project is to get a presentation and some insights about community’s network structure, communicative behavior of its participants and the role of group’s moderators. This research deals only with data available from social networking service but results obtained may be combined with surveys, interviews or even content and sentiment text analysis.

Our tool to obtain required data was a special software «VKminer» developed by The Laboratory for Internet Studies at Higher School of Economics. This software allow us to import publically available data using API of “VK” service. The collected dataset includes: 1) complete data from the "wall" of AIDS dissidents online group (starting from the date of the earliest post, December 2, 2008 and until December 4, 2013); 2) the metadata of all member users; 3) the data on "friendship" relations existing among community participants.

There are at least two points of view in sociology how to define online community and its boundaries: through self-identity and a formal membership or through behavior and participation in public interactions. The empirical implication corresponding to these approaches is that there are always two intersecting sets of users: those who became official members of a group, and those who contribute to public conversation. We found these sets very different: group counts 13,131 official members, 4,828 contributors and only 1,234 users were both members and contributors.

We analyzed and visualized “friendship” networks existing among both official members and contributors. In the case of AIDS denialists and from the user’s perspective friendships (the number and the structure of these relations, user’s inclusion into internal sub-communities) can influence his / her attitudes and behavior, to make him/her more confident on AIDS dissident theory, as well as determine the chances of his/her dissuasion. Also the user’s position in such network reflects the amount of social capital he/she holds within the community. From the community’s perspective "friendship" network mapping give an insight into informal structure of the group, its cohesion, partition, channels for information diffusion and mobilize community members for collective action.

We found the share of isolates reach 61% for the network based on formal membership. Network visualization shows that a community consists of at least two major dense cores. The network analysis enriched by metadata and data on communicative activity shows one of these core is fake: users from this subgroup do not show any activity and lots of them have blocked profile pages. The uncovering of such fake-core of suspicious members may indicate the use of "cheating" services by group's administration to increase its population.

The network structure changes significantly in shifting from definition based on formal membership to other one based on active participation. The "friendship" network of contributors is composed of isolates (85%) and the one large tightly connected core. The structure of this network is organized like "core – periphery" pattern and similar to some other networks found in health-related online communities.

Communicative activity is distributed unequal among community participants and the table below provide some grounds showing statistics on users' contributions. We hypothesize there is a core of the most active participants who produce and consume the majority of content and attention.

Type of contribution	Share of users contribute 80% of communication units
Total sum of posts and comments = 31 824 Content contributors = 1413 users	8% of all content contributors post 80% of all messages (share equal to 113 users)
Total "likes" = 38 628 "Likes" contributors = 4018 users	3% of all likers contribute 80% of all likes (share equal to 120 users)
	21% users who receive 80% of all "likes" and comments responding to their initial message

We refer to the concept of virtual power and analyze the relationship between communicative activity, social (network) capital and user's status in community. The results highlight that communicative activity (measured in posted and received messages, earned likes etc.) strongly correlated with the position occupied by the user in "friendship" network (his/her centrality).

Relation between friendship centrality and communicative activity				
	Posts + comments	Received comments	Received likes	Likes
Degree centrality	0.592**	0.615**	0.653**	0.369**
Betweenness centrality	0.375**	0.422**	0.445**	0.171**
Page Rank	0.544**	0.573**	0.602**	0.331**

N = 4828
** - Pearson correlation is significant at the 0.01 level (2-sides)

There is especially strong correlation between a number of ego's friends in group (degree) and an amount of likes he/she received. These findings demonstrate that AIDS dissident community's

structure are stratified in accordance to "core - periphery" pattern and consists of multiple layers of users, differing in intensity and forms of participation and their location in the "friendship" network. Users who only "like" something are passive and isolated mass; otherwise users who make content contributions become more "friendly" and tend to connect each other forming cohesive core-community.

User's status (moderator or not) in community is more associated with an attention and communicative activity than with a trust and social capital.

Relation between user's status and friendship centrality or communicative activity		
		Status
Social capital (trust)	Degree centrality	0.847
	Betweenness centrality	0.739
	Page Rank	0.776
Communicative activity (earning attention)	Posts + comments	0.930
	Likes	0.837
	Received likes	0.897
	Received comments	0.888
N = 719		
Gamma association coefficient		

The relation between liking and commenting reactions on posts within community is another question on user's communicative behavior arising in the quantitative approach. In the case of user as unit of analysis there is strong correlation ($R = 0.91$) between a number of likes and comments user receive. However for post as unit of analysis there is not significant correlation ($R = - 0.01$) but rather inverse effect: there are posts with many "likes" and only few comments and otherwise – with many comments and only few "likes". This finding demonstrate polarization of user's reaction on posts: posts with high "likes" value may be viewed as an instance of socially approval and preferable content versus posts without any likes and many comments - as an instance of conflicting and provocative content.

Finally we explore the hyperlink egonetwork of the AIDS dissident group and map cross-membership connections with other online groups. We use Jaccard similarity coefficient based on common members, common active users and common likers to evaluate the proximity for each pair of online groups. These maps provide an insight on a wider cultural context of meaning and practices surrounding AIDS dissident ideology and movement. We found AIDS dissident group is not embedded into any anti-medicine movement but has little intersection with anti-vaccination groups. Also we found a well-defined cluster of conspiracy theory, nationalists and the raw food diet groups within the environment of AIDS dissident group.