Higher School of Economics

Center for Institutional Studies

How trust enables social cohesion? The evidence from student friendship network dynamics

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Research Context

- How actions and characteristics of individual actors influence and shape the global social structure? (Merton, 1938, 1945; Coleman, 1986).
- In literature trust is considered as an important factor of social cohesion and integration (Uslaner 2002, 2013).
- How trust facilitates the mechanisms of social ties formation of micro-level and how it aggregates individuals into macro-level social structures? Still little understanding

Research Question

What is the role of trust in social network formation and dynamics?

Background

- Trust is an important element of social life. Positive links between individual trust and

- income (Bjørnskov, 2008)
- personal happiness (Kuroki, 2011)
- health (Subramanian et al., 2002)
- academic performance (Ben-Ner & Putterman, 2009)

- Trust serves as a 'social glue' in social network formation and helps people from different social groups establish relationships Uslaner (2002, 2013).

- **However there are no empirical studies which show the micro-level connections between social ties and trust.**

Data Description

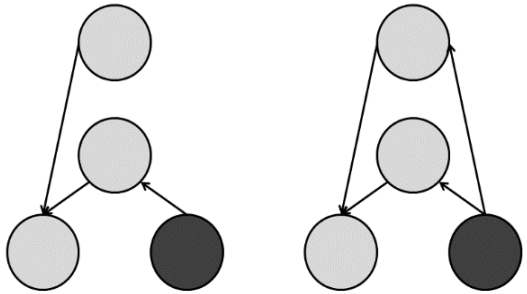
- First-year students at HSE Economics dept.;
- Questionnaire survey in 3 waves during the year: October 2013, February 2014, June 2014;
- Data about trust in 2 waves of survey : October 2013, June 2014;
- Data about USE scores in Math and Russian language from administrative database;
- We analyze data about 117 students (90% of the whole cohort);
- 5 study groups, in average 26 students in each group;
- 69% female, 31% male students.

Trust measurement

Trust was measured by generalized trust question (“*Generally speaking, would you* say that most people *can* be trusted”) with two possible answers “Yes” and “No”.

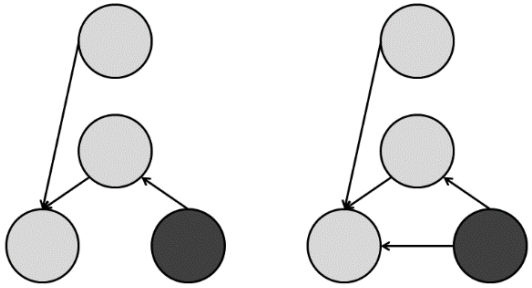
Hypotheses

- H1. *People who trust are more likely than people who do not trust to form relationships with people without shared friends;*



Nodes are students, ties are friendship connections. Black circle is a student who trusts.

- H2*. People who trust are more likely to form connections with people with shared friends and will befriend the friends of their friends.*



Nodes are students, ties are friendship connections. Black circle is a student who trusts.

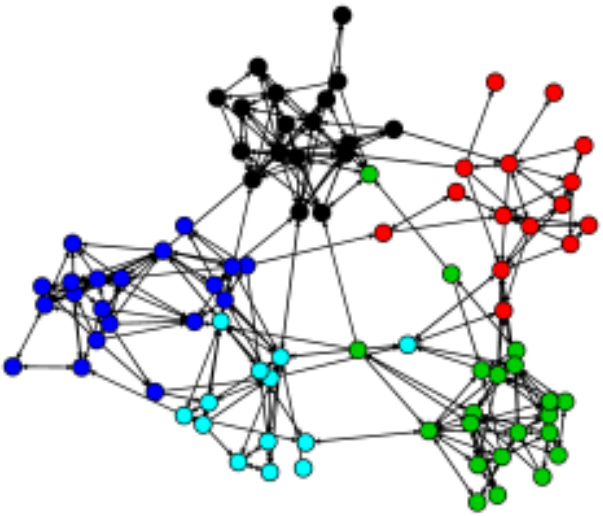
Network Data

- 2 types of networks:
- **Friendship:** Please indicate your classmates with whom you spend most of your time
- **Preexisted:** Please indicate classmates you named in questions 1 and 2 that you knew before the university
- All networks are directed, number of nominations are not limited.

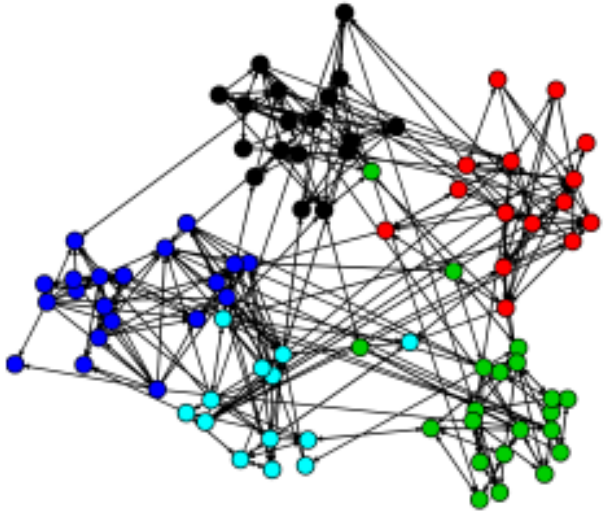
Network Descriptive Statistics

	Friendship network		
	Wave 1	**Wave 2**	**Wave 3**
Nodes	**117**	**117**	**117**
Edges	**715**	**662**	**557**
Density	0.053	0.049	0.041
Reciprocity	0.63	0.60	0.51
Transitivity	0.35	0.37	0.42
Jaccard Coeff.	–	0.35	0.32

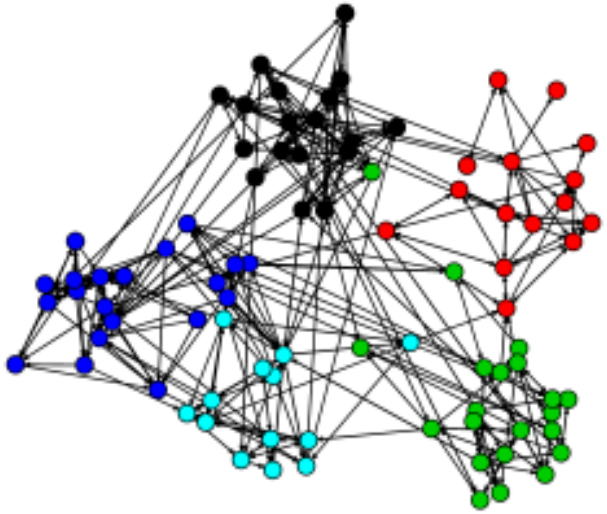
Friendship Network Visualizations



Wave 1



Wave 2



Wave 3

Node color indicates study group affiliation

Data about Trust

- Generalized trust varies over time in our sample. Students enter new social environment and some of them can face difficulties and changes, which can somehow influence their trust. Not all students change their behavior, so these changes are important.
- In the first wave 54% of students trust people, 46% - do not trust. The same distribution is in the third wave.
- The correlation between responses is 0.54.
- 10 students (9%) are losing trust in the period between observations (6 male, 4 female).
- 11 students (9%) begin to trust in the period between observations (4 male, 7 female).
- **Those students who trust in both waves are coded as trusted.**
- **Students who do not trust in at least one wave are coded as not trusted.**

Methods

Stochastic actor-oriented models (Snijders et al., 2010):

- Changes within networks are modeled as outcomes of Markov process;
- Actor-driven models: each actor within the network improves its position;
- The network evolution is a continuous process and macro-changes within the network are the results of several micro-changes;
- At each time step actor changes either an outgoing tie or behavior;
- Actors do not coordinate actions of each other;
- Method of moments in *RSiena*.

Effects

- Basic network effects: density, reciprocity, popularity, activity;
- Triadic effects: transitivity, 3-cycles, 2-path;
- Other types of networks: preexisted, study in the same group;
- Gender effects: ego, alter, similarity;
- Trust: ego, alter, same, trust x transitivity, trust x 2-path;
- USE: ego, alter, similarity

Results (1)

	Model 1 (baseline)		Model 2		Model 3	
Parameter	Estimate(SE)	t-ratio	Estimate(SE)	t-ratio	Estimate(SE)	t-ratio
Rate (1 period)	18.00***(1.25)	-0.02	17.84***(1.45)	0.03	17.96***(1.72)	-0.03
Rate (2 period)	17.73***(1.24)	0.01	17.70***(1.57)	0.00	17.81***(1.65)	0.01
Density	-1.98***(0.13)	-0.02	-1.93***(0.13)	0.01	-1.97***(0.13)	0.01
Reciprocity	1.65***(0.01)	-0.02	1.67*** (0.11)	0.00	1.66*** (0.11)	0.06
Transitivity	0.30*** (0.03)	-0.01	0.30*** (0.03)	0.00	0.30*** (0.03)	-0.01
3-cycles	0.32***(0.04)	-0.01	-0.32***(0.05)	0.00	-0.32***(0.05)	0.00
2-path	-0.11***(0.03)	0.01	-0.12***(0.02)	0.02	-0.11***(0.03)	0.05
Popularity	0.00 (0.01)	-0.01	0.00 (0.01)	0.01	0.00 (0.01)	-0.01
Activity	-0.03***(0.01)	-0.03	-0.03***(0.01)	0.01	-0.03***(0.01)	-0.01
Same group	0.62*** (0.06)	-0.04	0.62*** (0.06)	0.01	0.62*** (0.06)	0.00
Know each other before enrollment	0.93*** (0.14)	0.06	0.93*** (0.13)	-0.03	0.93*** (0.13)	0.05

Results (2)

	Model 1 (baseline)		Model 2		Model 3	
Gender alter (M=1)	0.12 (0.07)	0.06	0.13* (0.06)	0.01	0.12 (0.07)	-0.02
Gender ego	0.15** (0.06)	0.03	0.14* (0.07)	0.03	0.15* (0.07)	0.01
Gender similarity	0.24***(0.06)	-0.03	0.23*** (0.06)	-0.02	0.24***(0.06)	-0.01
Trust alter (Trust=1)	0.13**(0.06)	-0.04	0.15**(0.06)	-0.03	0.13** (0.06)	0.01
Trust ego	0.13* (0.06)	0.00	-0.03 (0.08)	-0.03	0.15 (0.08)	-0.03
Trust similarity	0.16***(0.05)	-0.03	0.13* (0.06)	0.03	0.16***(0.06)	0.02
USE alter	0.00 (0.00)	-0.01	0.00 (0.00)	0.00	0.00 (0.00)	-0.05
USE ego	0.00 (0.00)	0.01	0.00 (0.00)	-0.02	0.00 (0.00)	-0.02
USE similaruty	0.23 (0.15)	0.00	0.24 (0.16)	-0.02	0.24 (0.14)	0.01
Trust ego x 2-path			0.09* (0.04)	0.03		
Trust ego x Transitivity					-0.01 (0.02)	-0.06
Overall t-ratio	0.15		0.12		0.21	

Conclusion

H1. *People who trust are more likely than people who do not trust to form relationships with people without shared friends* **YES**

H2. *People who trust are more likely to form connections with people with shared friends and will befriend the friends of their friends* **NO**

Conclusion

- Trust-based social selection takes place. Students who trust befriend those who also trust, while students who do not trust form ties with people who do not trust;
- Students who trust tend to be more popular within the friendship network;
- Students who trust tend to be more active within the friendship network.

Discussion

- Trust is an important factor of the social network formation;
- People who trust are more likely to be more popular in friendship social network;
- We find the trust-based social segregation. It means that people who trust are more likely to form and support friendship connection with people with the same trust;
- We find out that trust is important for connecting different communities within the social network (Burt, 2004).

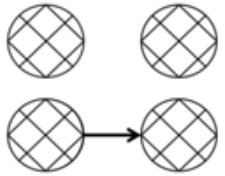
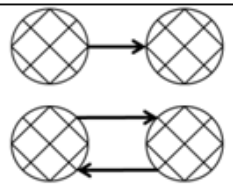
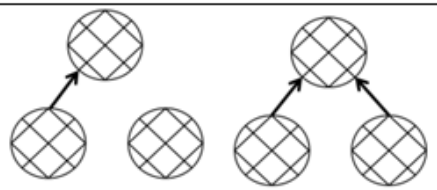
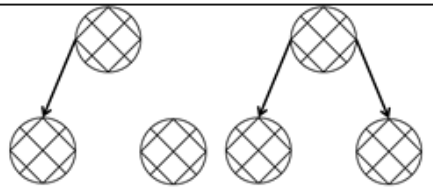
These results are consistent with the theoretical ideas about the role of trust in social networks formation (Uslaner, 2002, 2013) and show the mechanisms how trust works as a “social glue”.

Thank you for your attention!

Questions?

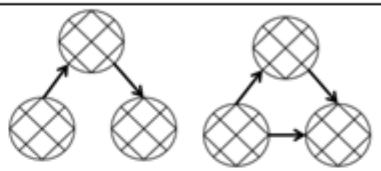
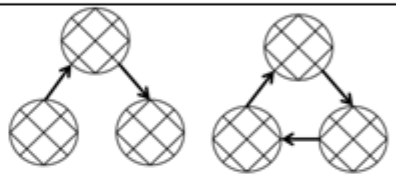
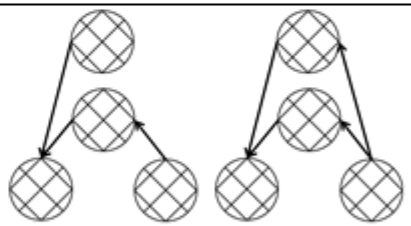
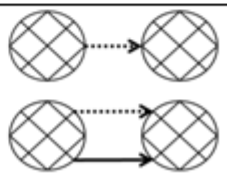
Additional materials

Effects description (1)

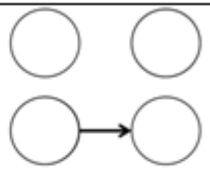
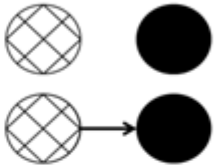
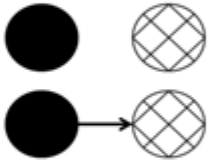
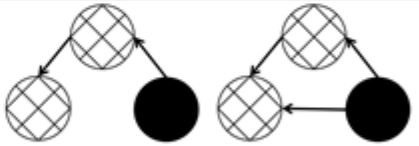
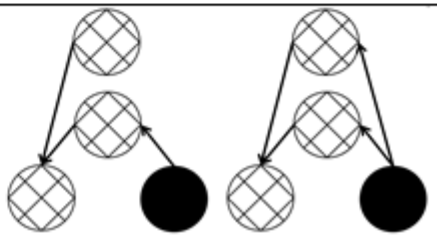
Effect	Description	Picture
Controls		
Density	Ego's tendency to create ties	
Reciprocity	Tendency of actors to reciprocate relations	
Popularity	Actor's popularity	
Activity	Actor's activity	

Effects description (2)

Triad effects

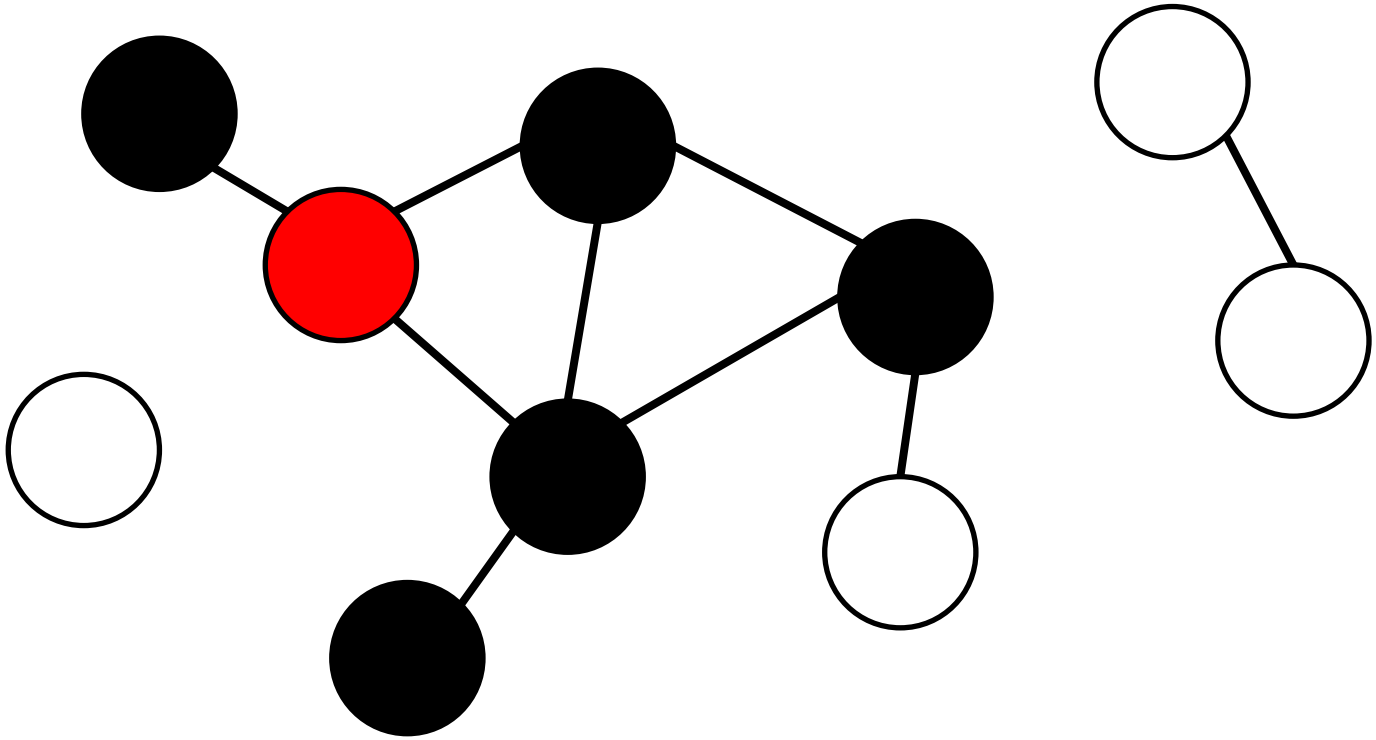
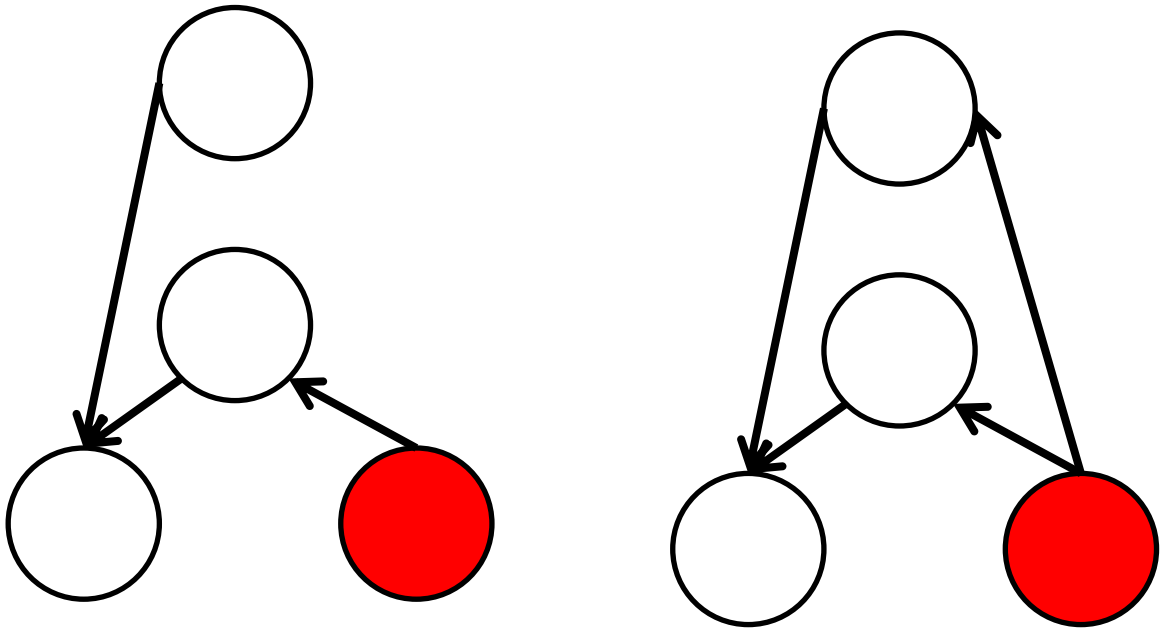
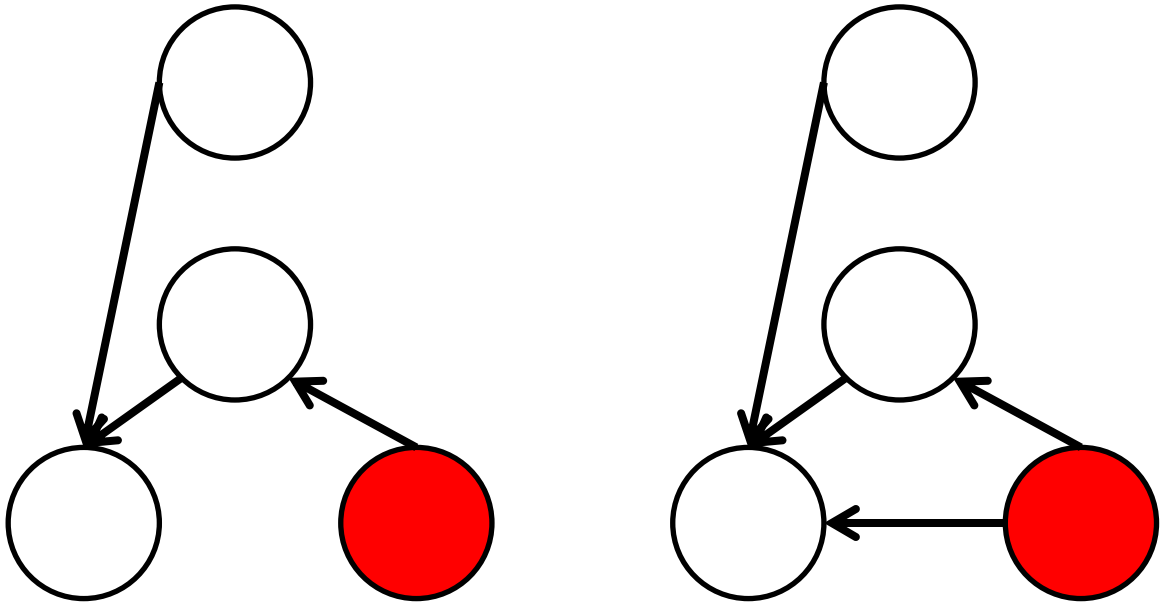
Transitivity	Tendency of actors to befriend friends of their friends	
3-cycles	Tendency to create cycles	
2-path	The tendency of actors to have several common friends	
Ties in exogenous networks		
Effect of exogenous network	Tendency of actors to befriend with people whom they knew before enrollment	

Effects description (3)

Attributes effects (trust and gender)		
Social selection	Tendency of actors to create ties with similar others	
Attribute alter (trust)	Tendency of actors who trust be more popular	
Attribute ego (trust)	Tendency of actors who trust be more active	
Attribute ego (trust) x Transitivity	Tendency of people who trust form ties friends of their friends	
Attribute ego (trust) x 2-path	The tendency of actors who trust to have several common friends	

Social environment

- We define social environment as student's friends and friends of their friends.



Nodes are students, links are friendship ties. The black nodes are the members of the 'social environment' of red nodes. White nodes are not members of this social environment.