Social Networks in Classes and Students' Psychological Comfort

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FIFTEEN THOUSAND HOURS

School social environment is shaping everyday lives of children and adolescents in many ways but educational research pays much more attention to academic achievement outcomes than to social and emotional comfort of school environment.

Our approach to studying school environment: measuring attitudes (motivation, satisfaction, school belonging) along with the elicitation of social networks in school classes: networks of friendship, support, help, and aggression.

DATA FROM LARGE-SCALE SURVEYS

Study 1: Popularity and academic performance

- 98 schools
- 309 classes
- 5058 students

Study 2: Belonging and network topology

- 192 schools
- 553 classes
- 2010 cliques
- 10924 students

Such survey data are nearly unique in SNA research. It allows for multi-level analysis with schools, class networks and their components (cliques) as units of analysis. We can take into account substantial heterogeneity of schools and classes within schools. We owe a debt of gratitude to HSE Basic Research Program not only for generous funding but for patience in all the time we were learning how to collect such data.

POPULARITY AND ACADEMIC PERFORMANCE

POPULARITY

Sociometric popularity is a measure of social acceptance and status. It is derived from questionnaires as the number of nominations of a given student by her/his classmates = indegree centrality in a network.

Interpersonal qualities or characteristics, which lead to social acceptance, differ for children from groups with diverse social values and across classrooms *(Lubbers M., 2003; Meisinger E.B. et al., 2007)*

CLASSROOM CONTEXT: MOTIVATION

Measured by 9-item scale with subscales

- School is just a waste of time
- Even those who don't do well in school can reach success in life
- Only with good education one can get a good job

- There are some school subjects that we discuss with my classmates after lessons
- I am so interested in some school subjects that I do extra work (read additional literature, go to science club etc.)
- I am willing to commute to school if the school is good

- It is interesting for me to study in school
- My grades are more important for my parents and teachers then for myself
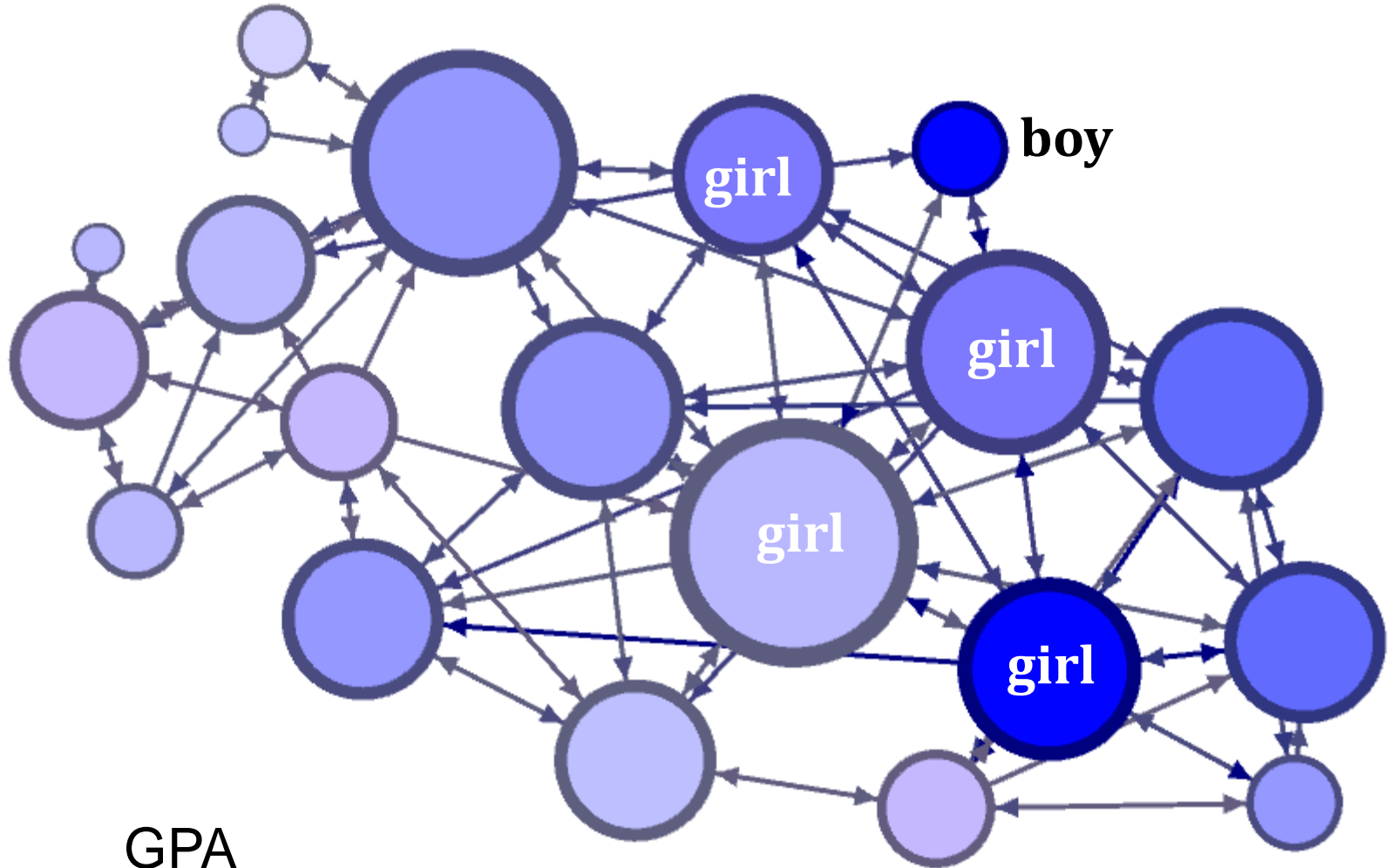- My friends are making fun of people who work hard at school

DISTRIBUTION OF CLASSROOM MOTIVATION
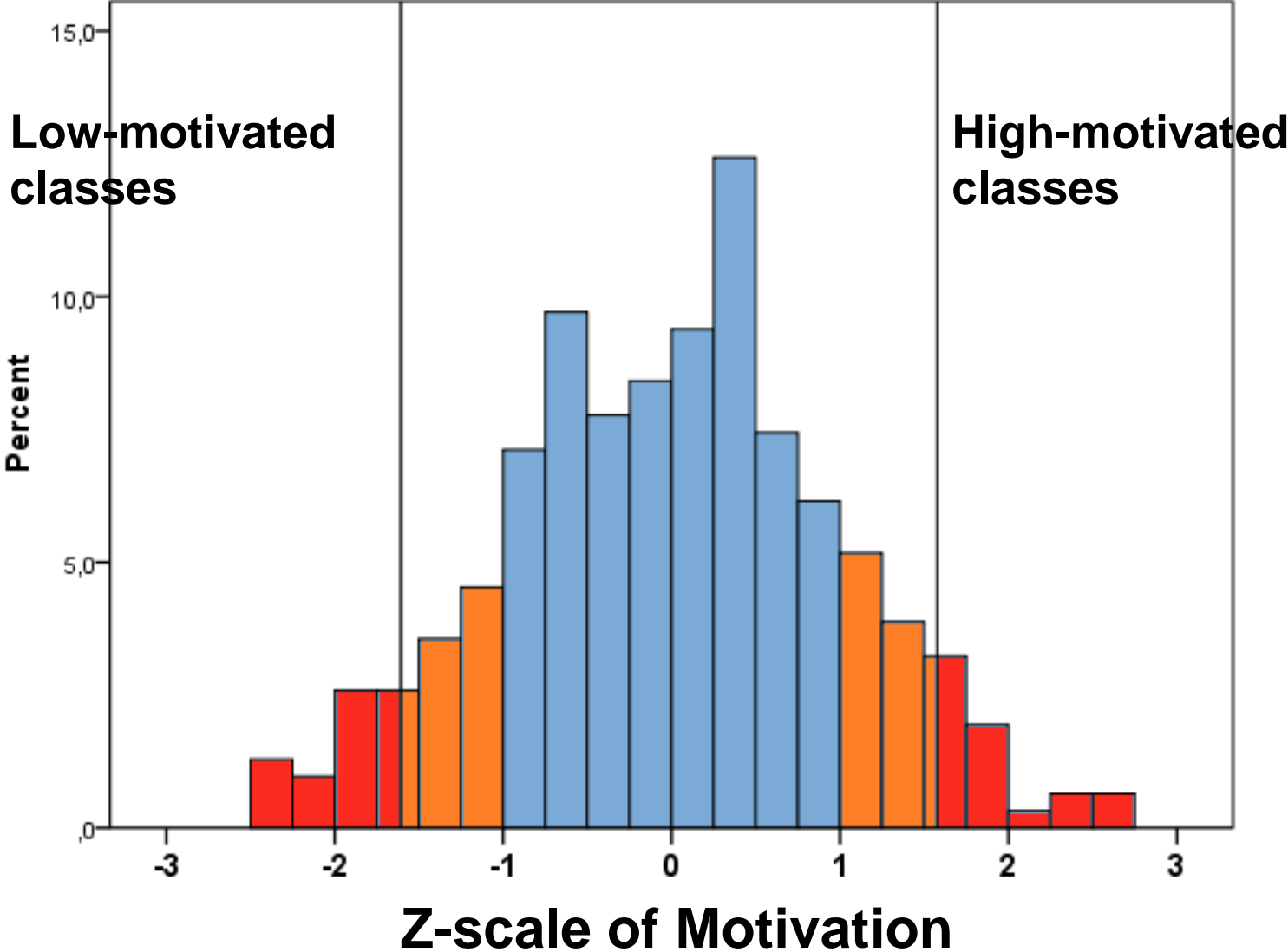
POPULARITY AND SCHOOL PERFORMANCE

- Do good grades increase student popularity among peers?

- Does this effect differ for boys and girls?

- Does this effect depend on classroom context?

NETWORK OF CLASSROOM FRIENDSHIP

girl

boy

girl

girl

girl

GPA

min   max

DATA ANALYSIS

p2 model: separate models for three groups of classes

       Low-motivated classes – 23 networks

       Average-motivated classes – 226 networks

       High-motivated classes – 21 networks

HLM: multilevel interaction effects

   Sex * GPA * Class level of motivation

P2 RESULTS

	High-motivated class	Average-motivated class	Low-motivated class
	Parameter Estimate (SE)		
Receiver covariates			
GPA	0,2556 (0,0958)	0,2694 (0,0305)	0,4896 (0,1386)
Boy * GPA	**0,0703 (0,1476)**	**0,002 (0,0009)**	**-0,4867 (0,1826)**
Reciprocity	3,5432 (0,1631)	3,2891 (0,0686)	3,255 (0,1377)
Density	-3,382 (0,2313)	-3,5757 (0,0862)	-3,9186 (0,2674)
Density covariates			
Receiver boy	0,2556 (0,0958)	0,8464 (0,1031)	0,9221 (0,2182)
girl to girl	0,0703 (0,1476)	1,5924 (0,0541)	1,7365 (0,1448)
boy to boy	3,5432 (0,1631)	0,7209 (0,0555)	0,7 (0,1299)
majority to majority	-3,382 (0,2313)	-0,2133 (0,0614)	0,1185 (0,1995)
minority to minority	0,2556 (0,0958)	0,3699 (0,085)	1,1701 (0,3098)
majority to minority	0,0703 (0,1476)	-0,26 (0,0987)	0,3658 (0,3792)
Random effects			
Sender variance	0,7367 (0,1058)	0,8179 (0,0527)	0,6661 (0,0996)
Receiver variance	0,7776 (0,1074)	0,6479 (0,0419)	0,8022 (0,1159)

HLM RESULTS

**Interaction effect
GPA*Gender**
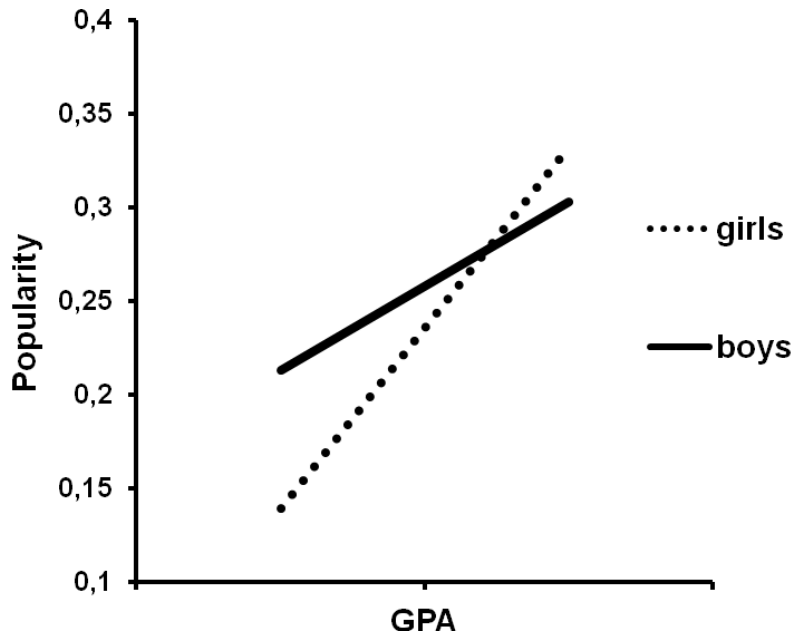
**Interaction effect
GPA*Gender*
Class level of motivation**
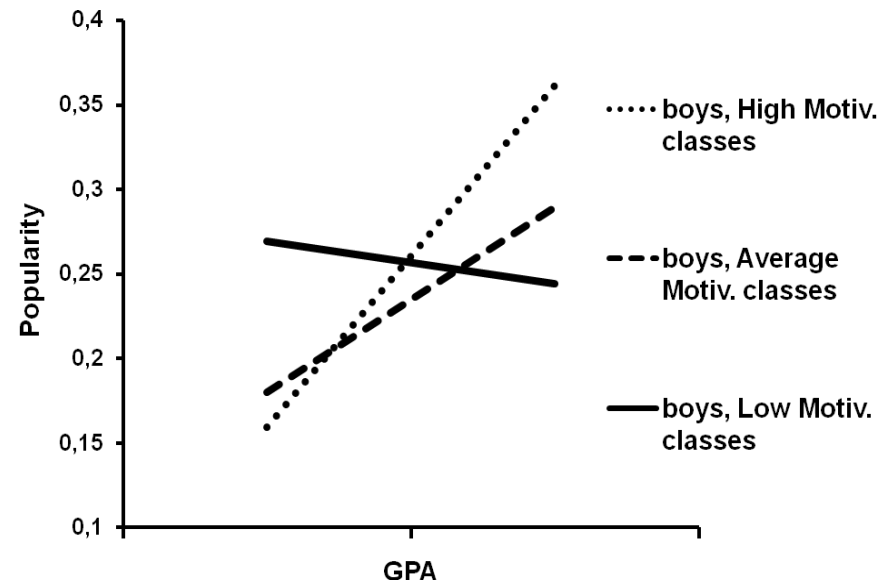
Boys' academic success decreases their popularity in low-motivated classes

CONCLUSION

- Girls popularity is positively related to GPA irrespective of classroom level of academic motivation

- In low-motivated classes boys' academic success decreases their popularity – good graders are marginalized

- This effect exists only in the classes with the lowest motivation.

BELONGING AND NETWORK TOPOLOGY

SENSE OF BELONGING

The sense of school belonging is a measure for positive relation of a student with school environment, and high sense of belonging shows the absence of social exclusion and psychological comfort of school environment.

Sense of belonging = sense of being liked, respected and valued by fellow students and by the teacher (Goodenow, 1993)

SCALE FOR MEASURING SENSE OF BELONGING

- I can really be myself at this school

- People here notice when I'm good at something

- It is hard for people like me to be accepted here

- I am included in lots of activities at this school

- I feel very different from most other students here

Cronbach's Alpha = 0.8

HYPOTHESES

- On individual level: Sense of belonging is positively related to students' embeddedness in classroom friendship networks.

- On classroom/clique level: sense of belonging is positively related to group cohesion.

VARIABLES FOR ANALYSIS

Characteristics that might affect sense of belonging:

- gender
- ethnic minority status
- recent migrant (came after 7 y.o.)
- family socioeconomic status

VARIABLES FOR ANALYSIS

Network structure variables: Individual level

- indegree
- outdegree
- eigenvector centrality
- betweenness centrality

Network structure variables: clique level
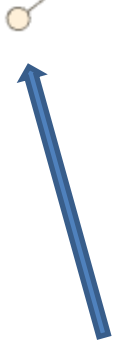
- transitivity
- clique size

Network structure variables: class level
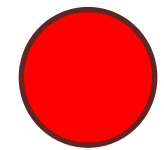
- transitivity
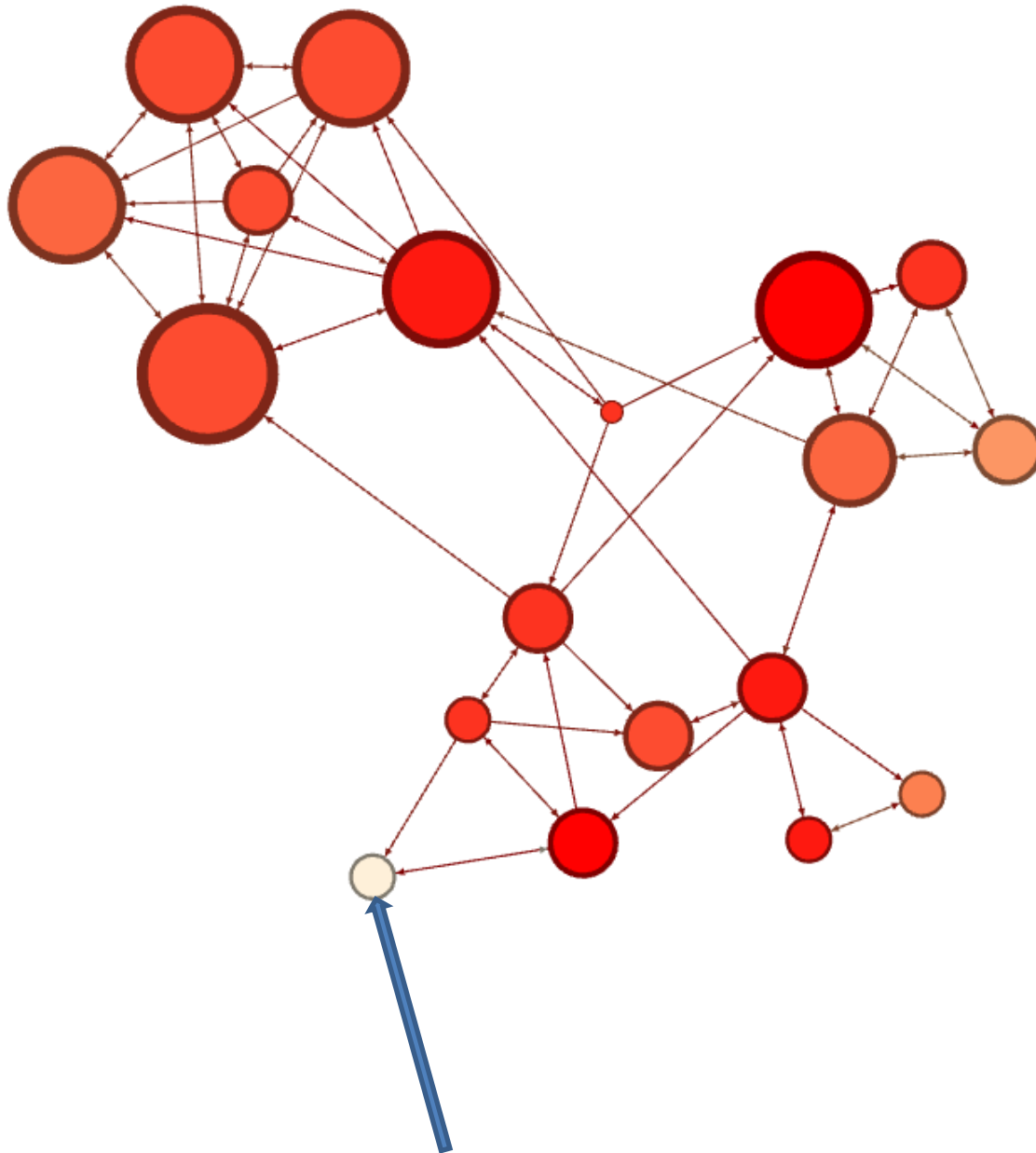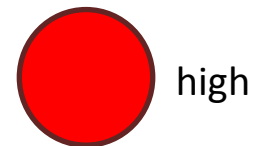- modularity
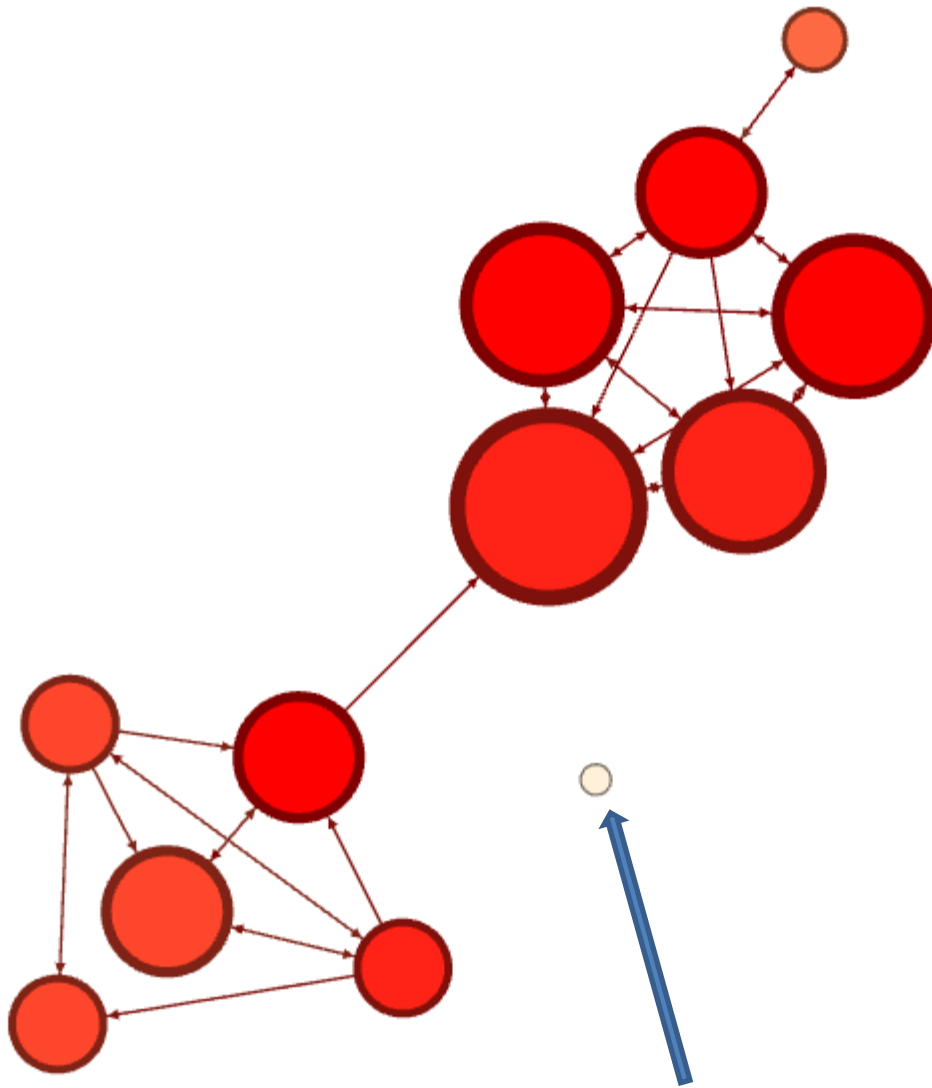
Sense of belonging

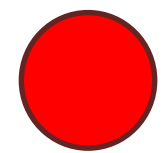high
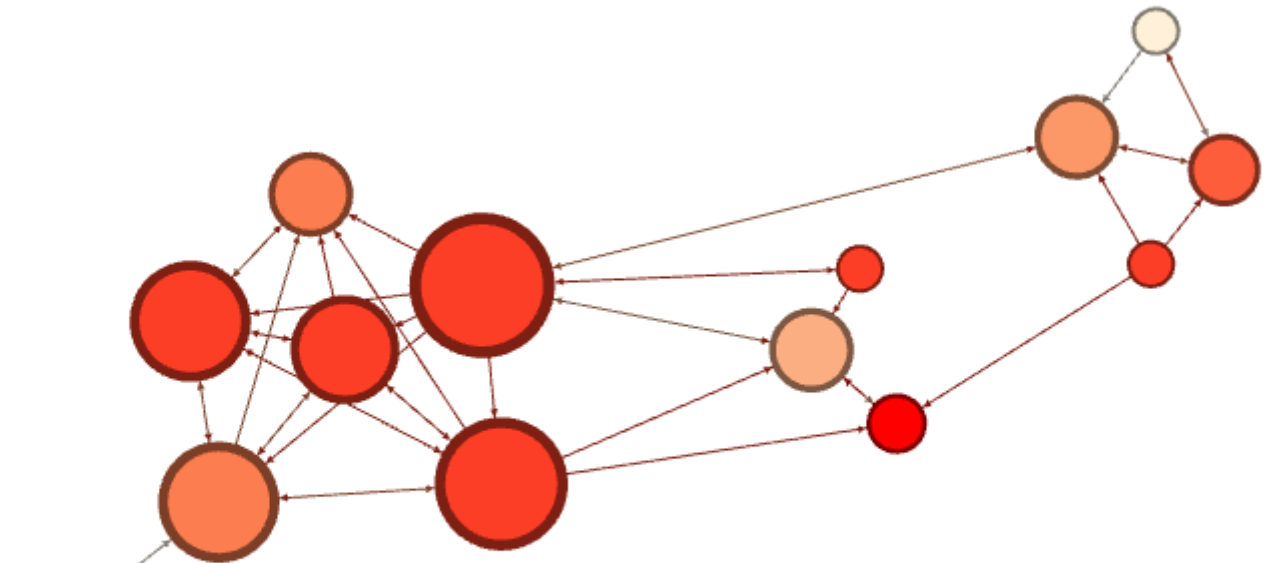
Indegree

high

low

Sense of belonging

low   high

Indegree

high

low

Sense of belonging

low   high

Indegree

high
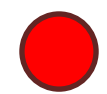
low

MULTILEVEL REGRESSION RESULTS

	Coefficient	SE	p-value
Intercept	3.052	0.019	<0.001
Level 1 - Students			
Eigenvector centrality	0.445	0.029	<0.001
Gender (girls)	0.063	0.012	<0.001
Recent migrants	-0.050	0.015	<0.001
Level 2 - Cliques			
N students in clique	0.026	0.005	<0.001
Transitivity (Clique)	0.257	0.045	<0.001
Level 3 - Classes			
Transitivity (Class)	0.181	0.085	0.03
Modularity	-0.042	0.071	n.s.

BELONGING AND STUDENT'S CHARACTERISTICS

- **migration status**: recent migrants have lower sense of belonging (those who were born in migrant families or came at early childhood don't differ from non-migrants)

- **gender**: girls have higher sense of belonging

- **family socio-economic status**: not related to belonging

- **ethnic minority status**: not related to belonging

BELONGING AND NETWORK TOPOLOGY

Individual level:

- **indegree, outdegree, eigenvector centrality** are positively related to belonging

- **betweenness centrality** is not related to belonging

Clique level:

- **transitivity and clique size** are positively related to belonging

Class level:

- **transitivity** is positively related to belonging

- **modularity** is not related to belonging

Thank you
and

HAPPY ORGANIZATIONAL BIRTHDAY,
DEAR FRIENDS!!!