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Multivariate Social Network Analyses of Negative and Positive Networks:

General like, General dislike, Defending, and Bully-Victim Relationships

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Social network studies

› Generally on relations with a positive interpretation:
  • Affect, exchange, cooperation

› But what about negative relations:
  • Aggression, bullying, delinquency, dislike?

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Aims

› Multivariate network analysis of positive and negative relations

  › Existence and dynamics of negative relations conditioned by positive relations

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Affective networks

› Tendency toward dichotomous relations, Incomplete signed graph

Positive network		
1 = present	0 = absent	
Positive relation	***Neutral or negative***	

› Combined network of positive and negative networks, More complete graph

Positive network		**Negative network**
1 = present	0 = both absent	1 = present
Positive relation	Neutral	Negative relation

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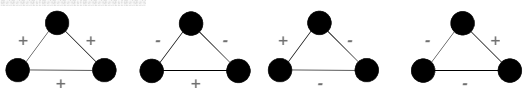
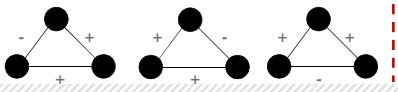
Structural balance theory (1)

› Actors will change relations to obtain balanced state

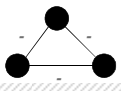
Balanced triads:



Imbalanced triads:



(im)balanced triad:



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Structural balance theory (2)

› A group of three or more persons is structurally balanced if two actors have a positive relation and they are consistent in their relations with others (either negative or positive)

› Assumption: Mixed reciprocity dyads omitted
› (e.g., $i \rightarrow j$ = positive, and $j \rightarrow i$ = negative)

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Data from Finland

- Classrooms of Finnish KiVa program (10-12 years)
- Reasonable number of classrooms:
- 3 schools with 18 classrooms, 393 students
- Selection: school with
  - More than three classrooms; nonresponse < 30%; more than 10 students in each classroom

Disliking (all students): *Whom do you like the least?*
Bullying (victims): *By which classmates are you victimized?*
Liking (all students): *Which classmates do you like the most?*

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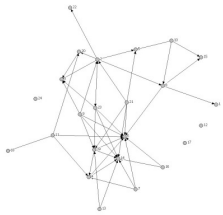
Modeling networks

- *Exponential Random Graph Models*
- Tie formation is assumed to depend on others.
- Homogeneity is assumed, which means that network parameters are the same for all actors in the network.

Observed network



Estimation

Simulated network

? = Configurations:
Subset of actors and ties between them:

-Reciprocity

- Sources 

- Indegree spread 

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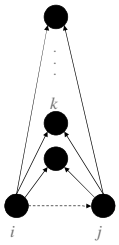
Shared negative out-ties

Sharing the same enemies ...
Being bullied by the same peers ...

- positive relationship more likely (line from *i* to *j*)



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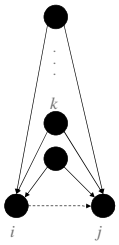
Shared negative in-ties

Disliked by the same peers ...
Bullying the same peers ...

- positive relationship more likely (line from *i* to *j*)
- (*default selection*)



General dislike and General like:

Arc dislike & like		-
Liking closure for shared in-ties of dislike		+
Liking closure for shared out-ties of dislike		*n.s.*

Bullying and General like:

Arc bullying & like	*Not estimated*	
Liking closure for shared in-ties of bullying		+
Liking closure for shared out-ties of bullying		+

Children with a structural equivalent position in the negative network are positively tied

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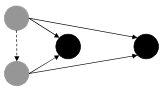
Shared negative out-ties ...



- Disliking the same children → no positive tie
- Being bullied by the same children → positive tie

- Dislike someone is no threat;
- Bullying is a serious threat
  - Search for support to stand stronger against bullies

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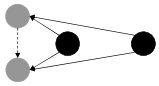
Shared negative in-ties …



- For both bullying and dislike, positive tie
- Default selection:
  - end up being befriended with peers who are initially not chosen
- Strategy of bullies?

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Bullies' strategy

- Bullies who harass the same victims defend each other
  - Goal to obtain powerful position: status (affection)
  - Strong ingroup
  - Weak and uninteresting outgroup of:
- Victims with the same bullies defend each other
  - Goal is to stand stronger against bullies

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Dutch sample

- 24 classrooms with 473 children (8-12 years)
  - Defending networks (Which classmates defend you when you are victimized?)
  - Bullying (Who starts when you are victimized?)

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Dutch multivariate results

- Same paterns of positive and negative ties

Defending for shared in-ties of bullying		+
Defending for shared out-ties of bullying		+

Tendency of bullies to defend other bullies who harass the same victims

Tendency of victims to defend other victims who are victimized by the same bullies

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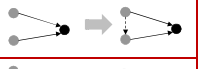
The next steps

- Currently working on implementation of structural configurations in SIENA
- Develop longitudinal models to disentangle causal relations, e.g.,

Social support-hypothesis (being bullied by the same bully leads to defending)	
Dual offense of the bully-hypothesis (bully starts to harass the friend of the victim)	

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To remember

- Negative and positive relations meaningful related
- Children with an equivalent position in the negative network are positively tied
- Sparse negative tie networks can statistically be modeled

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Thank you!

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	General Like	General Dislike	Bullying
Density	21.3%	18.3%	5.7%
Reciprocity	43.1%	24.0%	4.7%
Reciprocity	(+)	(+)	
In-ties spread		 (+)	 (+)
Out-ties spread		 (+)	
Isolates			(+)
Sinks			(+)
Multiple two-paths	 (-)	 (-)	 (+)
Shared in-ties	 (+)	 (+)	 (+)
Shared out-ties		 (+)	
Transitivity	 (+)		