



Networks with changing composition of the nodeset

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Joiners and leavers

Collection of longitudinal data on complete networks often faces the problem of *composition change*:

- › Complete network = all ties in a *meaningfully delineated social group*
- › This group can acquire new members over time (*joiners*), or lose old members (*leavers*).
 - Students entering or leaving a school.
 - Firms entering an industry or going out of business
 - Employees being recruited to an organisation or fired.

How to handle this situation in RSiena analyses?



Treatment by structural zero coding

- › When actors are not part of the group at a given measurement point, code their *outgoing and incoming* ties as “10”, meaning “*absent, and could not possibly have been present*”.
- › When running simulations, this is handled as follows:
 - A tie value “10” at the beginning of a period implies that the tie will remain structurally absent throughout the period, no matter what the tie’s value at the end of the period is.
 - A tie value “10” at the end of a period implies that no matter what the tie’s simulated value at the end of the period is, it is overwritten by “10” before any statistics are evaluated.
- › See RSiena manual section 4.1.2.



Treatment by composition change directives

- › When information is known about the exact time when actors left or entered the group in continuous time between observation moments, this information can be made use of.
 - In simulations, joiners enter at the indicated time point and then are simultaneously connected to the rest of the actors according to the data provided for the period begin (so, they do not necessarily have to ‘start from scratch’ but can inherit ties!)
 - Leavers just exit and cannot change their ties any more from this time point on; their last connection data can be provided for the period end.
- › Joiner and leaver data need to be provided in an additional file; see RSiena manual sections 2.1.2 and 4.7.



What to use?

- › Composition change directives allow to make use of more information. If information is scarce, this may be the better option.
- › Structural zero treatment is quite crude, if results can be obtained this way, they will likely be robust. But under scarce information conditions, it can happen that no results can be obtained.



Loosely related to structural zeros: structural ones

- › Sometimes, ties can be “*present, and could not possibly have been absent*”.
 - *Studying a communication network among employees, where some people are forced to communicate anyway (by their job contract).*
 - *Studying a growing network where ties once formed cannot be dissolved again.*
- › In such situations, tie variables can be coded as “**11**”.
- › See RSiena manual section 4.1.2.