

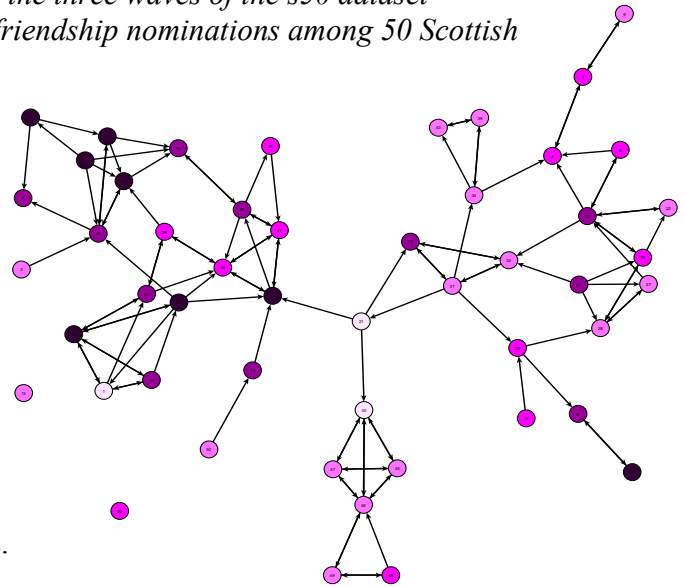
## Lab assignment: Co-evolution hypotheses

*Goal of this assignment is to become familiar with the analysis of influence and selection processes by way of actor-based modelling (Steglich, Snijders & Pearson, 2010). You study the co-evolution of friendship and alcohol consumption in the three waves of the s50 dataset (provided together with the software) that consists of friendship nominations among 50 Scottish girls of a cohort.*

The diagram on the right renders the second observation of the s50, assessed in 1996 when the girls had a modal age of 14 years.

Colour intensity reflects alcohol consumption on a 5 point scale, ranging from no consumption (lightest shade of violet) to consumption more than one a week (darkest shade).

The diagram suggests that alcohol consumption is ‘network auto-correlated’, i.e., that friends’ alcohol consumption tends to be more similar than the alcohol consumption of randomly paired girls.



1. Consider the following five loosely formulated “proto-hypotheses”:
  - a) Drinking is a cry for help. You start drinking when you don’t have (m)any friends.
  - b) If you want to make new friends, first drink a glass or two to overcome the threshold.
  - c) Drinkers want to be among themselves, and non-drinkers, too.
  - d) Drinkers smell of alcohol, that’s not particularly inviting.
  - e) Drinking is a social happening. You do as your friends do.

What does the diagram suggest – which hypotheses make sense at face value?

2. Rephrase and operationalise the hypotheses such that they can be tested by means of an RSiena analysis. A good way to proceed here is to first identify the dependent variable in the hypothesis (“*What is hypothesised to change here?*”), then identify the predictors (“*In response to which conditions would this hypothesised change happen?*”). Take a look at the available list of effects in RSiena, and pick one for each hypothesis. Note that sometimes, there is no unique pick.
3. Argue why in such an analysis, one would choose to include structural determinants of network formation as well. Make the case for the following parameters: reciprocity, transitivity, transitive reciprocated triplets, and 3-cycles.
4. Test the five hypotheses on the s50 dataset, making use of all three waves of the data.
5. Interpret the results. Which hypotheses are supported, which are not?