

The Relative Fit measure for choosing the number of clusters and blockmodel type

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A blockmodel is a network where the nodes are clusters of equivalent (according to the structure of the links) units from the studied network. The term block refers to a submatrix showing the links between two clusters (Doreian, Batagelj, & Ferligoj, 2005). When the structural equivalency (Lorrain & White, 1971) is used, the two types of blocks are possible: complete blocks and null blocks. Ideally, there are all possible links in complete blocks while there is not any link in null block. Yet in the case of empirical networks, some links frequently appear in null blocks and some non-links appear in complete blocks. Such links and non-links are called inconsistencies. The number of inconsistencies is reflected by a criterion function when the relocation algorithm for generalized blockmodeling is used. Therefore, a criterion function can be used as a fit function of an empirical network to a chosen blockmodel. Because the value of a criterion function depends on many factors (e.g., network size, density), the Relative Fit measure was proposed (Cugmas, Žiberna, & Ferligoj, 2019). It is argued that the values of the Relative Fit measure, obtained on different empirical networks, are comparable. The use of the Relative Fit measure for choosing an appropriate blockmodel type and the number of clusters will be discussed.

Cugmas, M., Žiberna, A., & Ferligoj, A. (2019). Mechanisms generating asymmetric core-cohesive blockmodels. *Advances in Methodology and Statistics*, 16(1), 17–41.

Doreian, P., Batagelj, V., & Ferligoj, A. (2005). *Generalized blockmodeling* (Vol. 25). Cambridge: Cambridge university press.

Lorrain, F., & White, H. (1971). Structural equivalence of individuals in social networks. *The Journal of Mathematical Sociology*, 1(1), 49–80.