**FALK — Modelling**

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**Modelling Genre Using Character Networks: The National Tales and Domestic Novels of Maria Edgeworth**

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Maria Edgeworth (1768–1849), a once-neglected Anglo-Irish novelist of the Romantic period, is becoming increasingly popular in academic circles. She was an innovative novelist, especially in her use of Irish dialect, witty dialogue, and social analysis.

Today, scholars tend to divide her novels into two main categories: (1) her ‘national tales’, which take place predominately in Ireland, and explore the Irish national character and the social structure of the Irish countryside; and (2) her ‘domestic novels’, which take place predominately in England, and explore issues of gender, race, and history in the daily lives of English aristocrats (Butler, 1972; Ferris, 2002; Hollingworth, 1997; Kelly, 1989; Voss-Clesly, 1979).

At first glance, this distinction is compelling, but it also underemphasises similarities between these groups of novels. Her books share common themes, such as an interest in education and historical progress, and a sound approach to her fiction would study both the similarities and differences between her ‘English’ and ‘Irish’ novels.

**Methods**

We can use a new technique—character network analysis—to model the dramatic structure of Edgeworth’s novels, and consider similarities and differences across this common generic distinction. Character network analysis was first introduced to literary scholars by Franco Moretti (2011; 2013), though sociologists had earlier experimented with literary applications of the technique (Stiller et al., 2003).

Here I apply this technique to three of Edgeworth’s ‘national tales’ and three of her ‘domestic novels’. The raw data was collected by hand, in the form of adjacency matrices for each chapter. Each character constituted a ‘node’ in the network. If they addressed another character in the novel, then an ‘edge’ was drawn between them. Each edge was given a ‘weight’ equal to the number of chapters in which the two characters speak to one another. This data was processed in R using the iGraph package (R Team, 2013; Csardi, 2013). Network diagrams were produced using Gephi (Bastian et al., 2009).

**Results**

Statistical analysis reveals important similarities between the two genres in this small corpus. First, three different measures of ‘centrality’ were calculated: *degree centrality* (which measures how many edges are connected to each node), *betweenness centrality* (which how many nodes are connected to one another through a given node) and *strength* (which is identical to betweenness centrality, but takes account of the ‘edge weights’) (Wasserman and Faust, 1994). Every novel had one character who topped every centrality measure, except for *Helen* (Table 1). All six novels are *Figurenromane*, with a single central protagonist. Second, a community detection algorithm was run, which tended to sort the characters in all the novels into different households (Figures 1–6, displayed on poster) (Blondel et al., 2008). All the novels, whether ‘domestic’ or ‘Irish’, depict the world as a network of noble households.

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But character network analysis also reveals significant differences between the ‘national tales’ and ‘domestic novels’. Four measurements were taken of the overall structure of the six novel networks: the *density* (the proportion of possible edges that are present in the network), the *transitivity* (the probability that A and B will be connected if they are both already linked to C), the *betweenness centralisation* (which measures how much greater the ‘betweenness’ of the most central node is compared to all other nodes), and the *degree centralisation* (which performs the same calculation, but on the basis of degree centrality) (Wasserman and Faust, 1994). On these four measurements, significant differences between the two categories of novel emerged (Table 2).

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The novels that were set in England or had female protagonists had higher average *density* and *transitivity*, suggesting that the ‘domestic novels’ depict smaller, more tightly knit communities, with more interactions between the different minor characters. The novels that were set in Ireland or had male protagonists had higher *betweenness* and *degree centralisation,* suggesting that in these novels, which feature more travel, the protagonist is more important for connecting the different regions in the network. *Harrington* is an interesting case, being the only novel set in England with a male protagonist. An individual value plot suggests there is a complex interaction of setting and gender in this small corpus (Figure 7, displayed on poster).

**Conclusion**

Character network analysis is a promising technique, because it produces intuitive results that are easy to reconcile with traditional methods. When we visualise the novels as network diagrams, we can immediately grasp an important similarity between Edgeworth’s ‘national tales’ and ‘domestic novels’: the presence of a dominating protagonist and the network of noble households. When we quantify the novels using statistical analysis, we can start to unpick different factors that are difficult to perceive on a close reading: particularly the hidden structural differences between male and female protagonists, which would bear further scrutiny.

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