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## Results

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## Results

1 The cladistic analysis returned 5740 equally most parsimonious  
trees (MPTs). The fit between the data and the trees was measured  
with the Retention Index, which was calculated as 0.72. Figure  
2 shows a consensus tree representing relationships that were  
5 present in the majority of the MPTs and levels of support for them  
returned in a bootstrap analysis. The tree, which is unrooted,  
splits the tales into three principal groups. The first group  
corresponds to international type ATU 333, which was present in 62%  
of the cladograms generated from the bootstrap replicates. The group  
10 comprises the 11th century Liège tale and three recognised sub-types  
of ATU 333: variants of Catterinella (with bootstrap support of 84%),  
variants of The Story of Grandmother (61% bootstrap support), and  
variants of the familiar tale Little Red Riding Hood (20% bootstrap  
support). The latter include two non-European tales, one from Iran,  
15 the other collected from the Ibo of Nigeria. The analyses separated  
Catterinella from the other tales, and suggest that the 11th  
century Liège tale diverged from the lineage leading to Little Red  
Riding Hood before the latter split from the oral tale The Story  
of Grandmother. The Little Red Riding Hood clade separates Perrault's  
20 classic version from more recent versions, including the Grimms'

18<sup>th</sup> century German text. However, the low levels of bootstrap support indicate a substantial degree of conflicting signal surrounding these relationships. The second major group can be identified as international type ATU 123. This group is less well supported than the ATU 333 group, being present in only 49% of the cladograms generated from the bootstrap analysis (although it was present in all of the MPTs returned by the original analysis). The first split (with bootstrap support of 59%) in this lineage separates the Indian tale of the Sparrow and the Crow from the others. The remaining tales split into two lineages, one leading to a pair of Aesopic fables (53% bootstrap support), the other leading to the folktale The Wolf and the Kids (59% bootstrap support). The latter includes a clade comprising the African tales, together with a tale recorded in Antigua (24% bootstrap support). The third major group is formed by the East Asian tales. This group was the least well supported in the bootstrap analysis (35%), and does not appear to contain any robust sub-groups larger than two taxa.

The Bayesian analysis returned a very similar set of results. Figure 3 shows an unrooted maximum clade credibility tree obtained from the posterior distribution. It represents the same three major groupings, with varying levels of support in the posterior distribution of trees. The ATU 333 group is again the most strongly supported, being present in 87% of the tree sample. Tales within

this group cluster into the same recognised sub-types of ATU 333  
45 that were returned in the cladistic analysis, including Catterinella  
(with posterior support of 94%), The Story of Grandmother (94%) and  
Little Red Riding Hood (54%), with the Liège tale forming a separate  
branch. Compared to the ATU 333 group, support for the ATU 123  
group is relatively modest at 55%. Relationships within the group  
50 separate variants of the Aesopic fable from the other narratives.  
The latter clade (51% posterior probability) includes European and  
Middle Eastern variants of The Wolf and the Kids, the Indian tale  
of the Sparrow and the Crow, and a clade comprising the African  
tales (55% posterior probability). The final major grouping consists  
55 of the East Asian tales, which has a posterior probability of 64%.  
Relationships within this group generally lack resolution, except  
for one clade that clusters two tales from Korea (TG12 and TG13)  
with one from Myanmar (TG14) (71% posterior probability).  
The NeighbourNet graph is shown in Figure 4. Once again, the tales  
60 are divided into the same three main groups, except the Indian tale,  
which does not cluster with any of them. Although the groups are  
clearly discernible, the overlapping boxes demonstrate conflicting  
splits in the data. This is especially clear in the East Asian clade,  
which exhibits a highly reticulated structure. Similarly, overlapping  
65 boxes obscure the phylogenetic structure within the ATU 123 group,  
although it is possible to identify a split between the fable and

folktale versions of the story, with the latter again including a clade of African tales (plus the Antiguan variant). The ATU 333 group, meanwhile, divides into two relatively well defined branches, one comprising variants of Catterinella and the medieval Liège tale, the other variants of Little Red Riding Hood and The Story of Grandmother (which each forming a distinct clade). Estimates of the overall tree-likeness/boxiness of the network yielded an average delta score of 0.3 and Q-residual score of 0.03.