

Michael Dunn (Max Planck Institute for Psycholinguistics, Nijmegen)

A time and place for languages: new perspectives from Bayesian Phylogeography

When were ancestral languages spoken, and where? Beyond the few cases where written texts of ancient languages have been preserved, it has proven extremely difficult to link reconstructed languages to concrete places and exact times. After an optimistic beginning in the 1950s, quantitative approaches to historical linguistics (glottochronology) suffered a collapse in confidence from which the discipline has only recently begun to emerge. New, phylogenetic approaches allow linguistics to answer old questions through new methods for inferring language family histories. And linguistic phylogenetic methods have also opened up new areas of enquiry, notably by using phylogenetic trees as a statistical 'scaffold' to test hypotheses about other historical process, ranging from population dispersal order (Gray and Jordan 2001) to evolutionary dependencies in structural change (Dunn et al. 2011).

Methodologically, linguistic phylogenetic approaches have been making great advances since the adoption of Bayesian phylogenetic inference methods. Bayesian phylogenetic inference combines more realistic models of language evolution with statistically sound methods of parameter estimation and model testing. The modeling methods include inferences about rate of change, and so an important early refinement to the methods was to allow external calibration points (a priori known dates for a subset of nodes on the tree) to be introduced, which in turn allow rates to be converted to dates.

Bayesian phylogenetic inference allows many different kinds of data to be incorporated, and one further refinement is to include spatial information about languages in the analysis. Models of spatial variation allow the known location of specified nodes of the tree to contribute information to the phylogenetic inference procedure, which in turn allows the spatial location of hitherto unspecified nodes to be inferred. These new methods of phylogenetic inference and the hypothesis testing techniques will be illustrated with case studies from a range of language families, including Indo-European, Aslian and Uralic.