

# Australian Models of Language Spread

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## Three problems with the Karnic data

1. Conflicting Subgrouping (6 different proposals over the last 80 years);
2. Conflicting correspondences, each supported by unusual changes;
3. Hard to define what's archaic, because of lack of knowledge (at this stage) of higher order groups.

## Use a network model

- ▶ Map networks for various features of the languages (= “characters”) and compare them.
- ▶ That is, isolate the areas which are ambiguous and quantify the ambiguity.
- ▶ Use the networks as input for further analysis:
  - ▶ regular vs. irregular correspondences
  - ▶ relative chronology
  - ▶ correlations with geography
  - ▶ weighting more or less common changes
  - ▶ ...

(This is “operationalising” what historical linguists traditionally do – it’s quantifying intuitions and testing them.)

- ▶ “Neighbor-joining” (Saitou & Nei, 1987) – NeighborNet application
- ▶ Data were processed and trees drawn with SplitsTree 4.0 (Huson & Bryant, 2006)

(Clustering algorithm – “group together languages that are most similar to each other and most different from other languages under consideration.”)

# Characters

- ▶ lexical (i.e. cognate words) (186)
- ▶ sound correspondences (63)
- ▶ pronouns (25)
- ▶ case morphology (4)

Lexical items were coded for cognacy; correspondences were coded as correspondences (not as changes). The different items were then weighted (so that pronouns were weighted more heavily than lexical items, and regularly attested correspondences were weighted more than singly attested ones).

## An example

**karnicrecords**

Browse

75 gloss south

Layout: basicwor

Variety	Form	Gloss	Splitstree	Co
Wangkayutyuru	karruwali	south	1	
Arabana	kudnankari	south	2	
Diyari	kunankari	south	2	
Ngamini	kunankari	south	2	
Wangkanguru	kunankari	south	2	
Yawarrawarrka	mudlapundra	south	3	
Yandruwandha	mulhapundra	south	3	
Pitta-Pitta	wakarrha	south	4	
Wangkumara	wangkumada	south	5	
Yan-nhanju	dhalatharj	south	n	

Record: 73

Total: 176

Unsorted

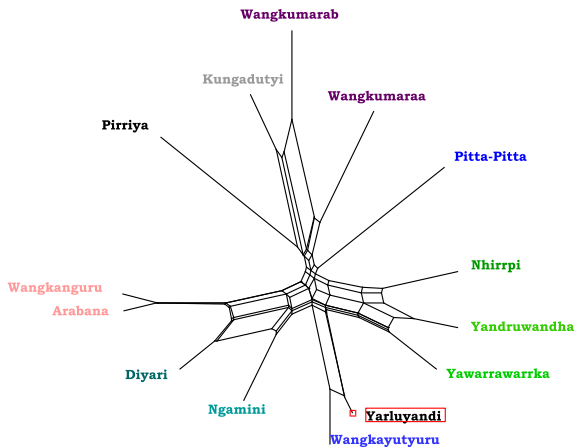
# Data

- ▶ Bower (1998), + recent work on Karnic lexical reconstruction.
- ▶ 14 varieties (those for which lexical data were available).

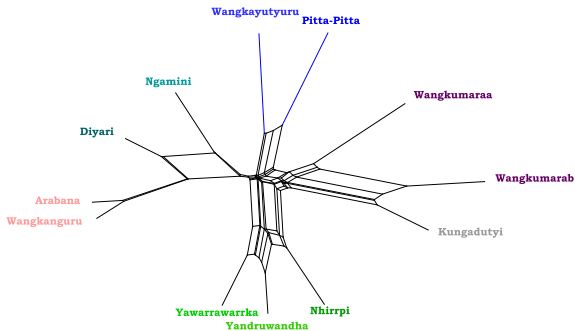
# Expectations

- ▶ network vs tree (this method will return trees in areas that have tree-like evolution)
- ▶ lower-level clustering
- ▶ What we're looking for:
  - ▶ previously unidentified clusters
  - ▶ more or less messy networks

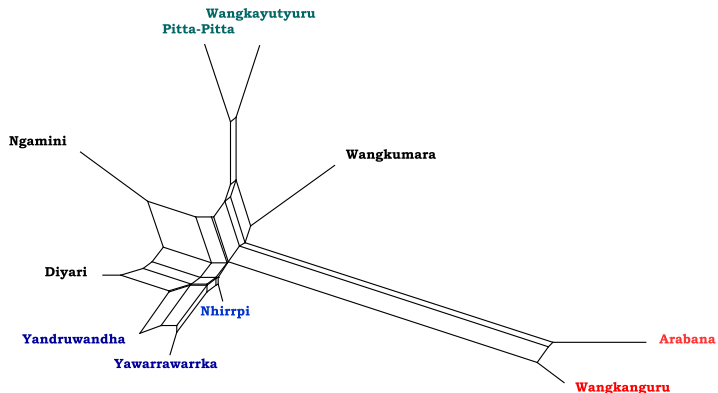
## Network: All Data



# Network: Pirriya and Yarluyandi Removed



# Network: Pronouns



# Summary

- ▶ This is a neat way of seeing the contribution of different types of language change to areal features.
- ▶ Confirmation of network-like evolution in several places in the tree.
- ▶ We can identify the areas that are more or less network-like.
- ▶ But there are still interpretation problems in working with this type of model.
- ▶ The method is sensitive to missing data (but so are other methods).

## Further directions

- ▶ Comparison with other computational methods (e.g. MP-models)
- ▶ More data, better data (e.g. Mithaka, more recent Diyari data, trying to fill in some gaps)
- ▶ Refinement of character weighting.
- ▶ Extension outside the immediate subgroup (Guyani, Adnyamathanha, Warluwarric, Yardli)

## Thanks to

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- ▶ SplitsTree is available from <http://www.splitstree.org>.

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