Lexical Stability and Kinship Patterns in Australian Languages*

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Overview

- How stable are semi-closed class lexical categories?
- Does system stability exist independently of lexical form stability?
- Is there evidence for paradigmatic changes in these categories (Traugott and Dasher, 2002; Anttila, 2003)?

⇒ Test with **kinship** data from **Pama-Nyungan** (Australian) languages, in particular, sibling terms.

Why Kinship?

- Universal language category; all languages have words for family members, though the systems vary across the world. Variation in the systems, however, is defined; there are a limited number of attested systems (see further Murdock 1968)
- Claimed to be **both** 'stable' phylogenetically and etymologically conservative (Dumont, 1953; Smith, 1963; Friedrich, 1966). This is important for a family like Pama-Nyungan, where there is extensive lexical replacement (Bowern and Atkinson, 2012).
- Allows investigation of system vs. lexical stability. Unlike some other closed class items (such as pronouns), kin terms are not grammatically peculiar.[1]

Data and Methods

- For the current study, we use **181** Pama-Nyungan languages (see map), coded for sibling system type (Murdock, 1968; Jordan, 2011).
- The types of system attested in our sample are summarized in Figure 1 below.
- Data come from Bowern's comparative files and the Austkin project;[2]
- The languages in the sample were those for which the sibling nomenclature system could be inferred. The Austkin database has 337 languages, but not all have female sibling terms attested. Others have data which was ambiguous in other ways and could therefore not be included.
- We restrict our analysis to Pama-Nyungan languages.
- Lexical reconstructions were completed using the comparative method (Rankin, 2003).

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[1]This is not to say that kinship cannot be marked in grammar. See, for example, Evans 2003 for discussion of 'kintax', where kinship marking is found on grammatical items such as pronouns.

[2]See `austkin.net` and Dousset et al. (2010) for further information.

- In the Austkin dataset there is some evidence for terms which vary based on the sex of the speaker (for example, a man's sister vs a woman's sister); however in each case for the languages in our dataset, these terms coexist alongside terms which are not differentiated by speaker.

Bayesian Ancestral State Reconstruction

- Bayesian trait correlation and reconstruction analysis (with BayesTraits (Pagel et al., 2004))
  - Maps traits onto a phylogeny
  - Probabilistic reconstruction of features to proto-languages (both root and intermediate nodes)
- The phylogeny used for the analysis is from Bowern and Atkinson (2012), recompiled with additional languages;
- We used Maximum Likelihood methods, with 200 tries (that is, each ML calculation was performed 200 times, in order to reduce the chances of finding local maxima);
- We also performed a comparison of evolutionary models (evaluated with Likelihood Ratio tests). BayesTraits estimates transition rates for character evolution across the tree. The model estimates the transition rates between character states and the likelihood associated with different state reconstructions at each internal node.
- Each transition rate is a parameter in the model; multistate data with many states have too many parameters to estimate reliably (here, for example, 7 states give 42 parameters). Transition rates can be constrained to reduce the number of parameters, allowing us to avoid model overfitting as well as increasing the tractability of the calculations.
- However, we have no a priori information about how many parameters are likely to be needed, or which transitions should be restricted. We therefore test this by running models with different parameter settings, and using the model which scores best using likelihood ratio tests.
  - Number of parameters [1, 2, 3, 12].

1 parameter A single rate for all state transitions;

2 parameter One rate for increasing the complexity of the system, another for decreasing it;

3 parameter Rare states are treated differently from common states (1 parameter for entering a common state, one for leaving it, one for being within a common state);

12 parameter One rate each for transition between each other the 4 most common states in the data.

  - 2 parameter models performed significantly better than the other models and so are reported on here.
  - In addition to estimating reconstructions at the root, we tested support for lexical reconstructions by 'fossilizing' nodes in the tree. That is, we set a subgroup or root node to a particular value and compare likelihood values of the models with and without the fossilized node. We compared estimates with the root node set at all possible parameter states.
- Ancestral state estimations are reported as probabilities. For example, for

		eB	eZ	yB	yZ	
Relative Age	n=5	A		B		
Sex of referent	n=19	A	B	A	B	(Yellow)
Rel. Age and sex of referent	n=85	A	B	C	D	(Red)
Sex distinction for older sibs	n=63	A	B	C		(Blue)
Age distinction for male sibs	n=10	A	B	C	B	(Green)
Unreconstructible		??	??	??	??	(Gray)
Ambiguous	n=3	A	B	C	B/D	(Purple)

Table 1: Types of Sibling System

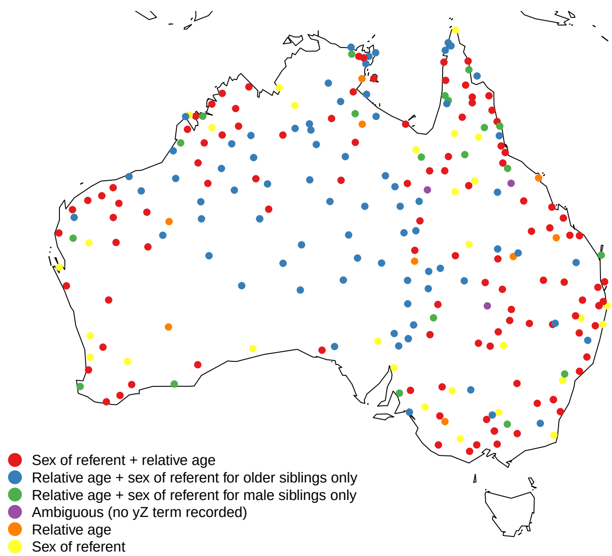

Figure 1: Map of languages in sample

Results : Trait Inference

- 2-parameter model (increasing complexity vs. decreasing) significantly outperforms 1-parameter model [log BF=7]
- Root node fossilization provides positive (but not strong) evidence for a four-term reconstruction [log BF=3.1]; this tallies with root node reconstruction in the 2-parameter model, which favors four-term reconstruction over three-term (with single term for younger siblings), but not strongly (probability of 51% vs 30%).
- Lower level subgroups show differing degrees of support (clades with decisive support are colored).
- Three-term systems predominate in the West, while four-term systems characterize Eastern/Central groups.
- Evidence is equivocal for reconstruction in Yuin-Kuri, Lower Murray, Kalkatungic and Yolŋu, where trait reconstruction does not provide decisive support for either three- or four- term systems.
- Other subgroups show support for either three- or four-term systems, except for Mayi, which has

an age-graded distinction for male siblings only (that is, older, younger brother, but a single 'sister' term).

Results : Comparative Method

- There is extensive heterogeneity in words for siblings; few terms are reconstructible beyond the low-level groups.
- There is especially severe instability in 'sister' terms (particularly yZ) which leads to difficulties in system reconstructions using lexicon alone.
- Few **loans** appear in the system (27/885 items: 3%). Examples include Bularnu (Warluwarric, Pama-Nyungan) *gawityi* 'older sister', a loan from Garrwa (Garrwan), and Mirniny *marlangu* 'younger sister', which is a likely loan from a language of the Wati subgroup.
- Much **semantic shift**, from several distinct sources.
  - **kin terms**: Karnic *kaku eZ ~ FF ~ SC; Maric *kami eZ < FM; Arandic *katya yB < eB
  - **human nouns** Thura-Yura *nhungar '< man'; *yapa 'eB ~ man'
  - **body parts** *katha 'eB < head'; these terms are probably sourced from the auxiliary sign language terms for kinship terms. Kendon (1988, 330ff) provides a detailed description of kinship sign language and the way in which body parts are used to refer to kin.
  - Other lexical items: Yolŋu *wakinŋu* 'rubbish' is used as a way for men to refer to their younger sisters; Wangkayutyuru *kupa* 'yB < small';
  - Some evidence for derivation by affixation: Paman *yapa- (see reconstructions chart). Some Eastern languages include the feminine suffix *-kan* on sister terms.
- Three conflicts (Central NSW, Mayi, Bandjalang) between lexical and trait reconstructions.
  - **Central NSW:** Lexical evidence points to three-term system with age distinction for male siblings only; trait reconstruction, however, finds evidence for a three-term system with gender distinction for older siblings, but not for younger. There are difficulties with the lexical reconstruction, however; the 'older brother' terms are reconstructed mostly on the basis of *tyatya's widespread occurrence outside the subgroup. *galuma:y is straightforward for 'younger brother'; Gamilaraay and closely related varieties have a single term *bagaan* 'sister', but all other languages have distinct terms.
  - **Mayi:** Only terms for 'older brother' and 'younger brother' are reconstructible; other terms are different and untraceable in each language.
  - **Bandjalangic:** A single term *panam* 'brother' is reconstructible, along with *nanaŋ* 'older sister' (no term for younger sister is reconstructible); the system is reconstructed as four term, however, probably because of the rarity of systems other than the four-term or three-term with sex distinction for older siblings.

Conclusions

- Kinship **systems** show greater stability than the lexicon marking them;
- We do see, however, shifts between three-term and four-term systems (in both directions).
- The domain of sibling terms thus provides evidence for an interesting case of mismatch between lexical stability and system stability and reveals evidence for system stability even in the absence of lexical stability.

- It also provides us with an insight into how lexical replacement proceeds, as a mapping onto an existing lexical structures and oppositions.
- It shows that kinship patterns can be conservative even when the lexical material used to express the forms is subject to frequent lexical replacement and semantic shift.
- Finally, this research provides insight into the lexical sources for sibling terms, in particular,

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