

What phonological diversity does and doesn't tell us

The consonants of Australian indigenous languages



Outline

- Indigenous languages of Australia: low level of phonological diversity
- Well-known points of commonality in Australian consonant systems
- New respects in which the languages are similar
- How this might figure in the relationship between
 - possible languages, probable languages, and
 - attested phonological diversity

At a glance

	coronal			peripheral	
	apical alveolar	apical retroflex	laminal palatal	dorsal velar	bilabial
plosive	t	ʈ	c	k	p
nasal	n	ɳ	ɲ	ŋ	m
lateral	l	ɭ	ʎ		
trill	r				
rhotic approx. semi- vowel		ɽ	j		w

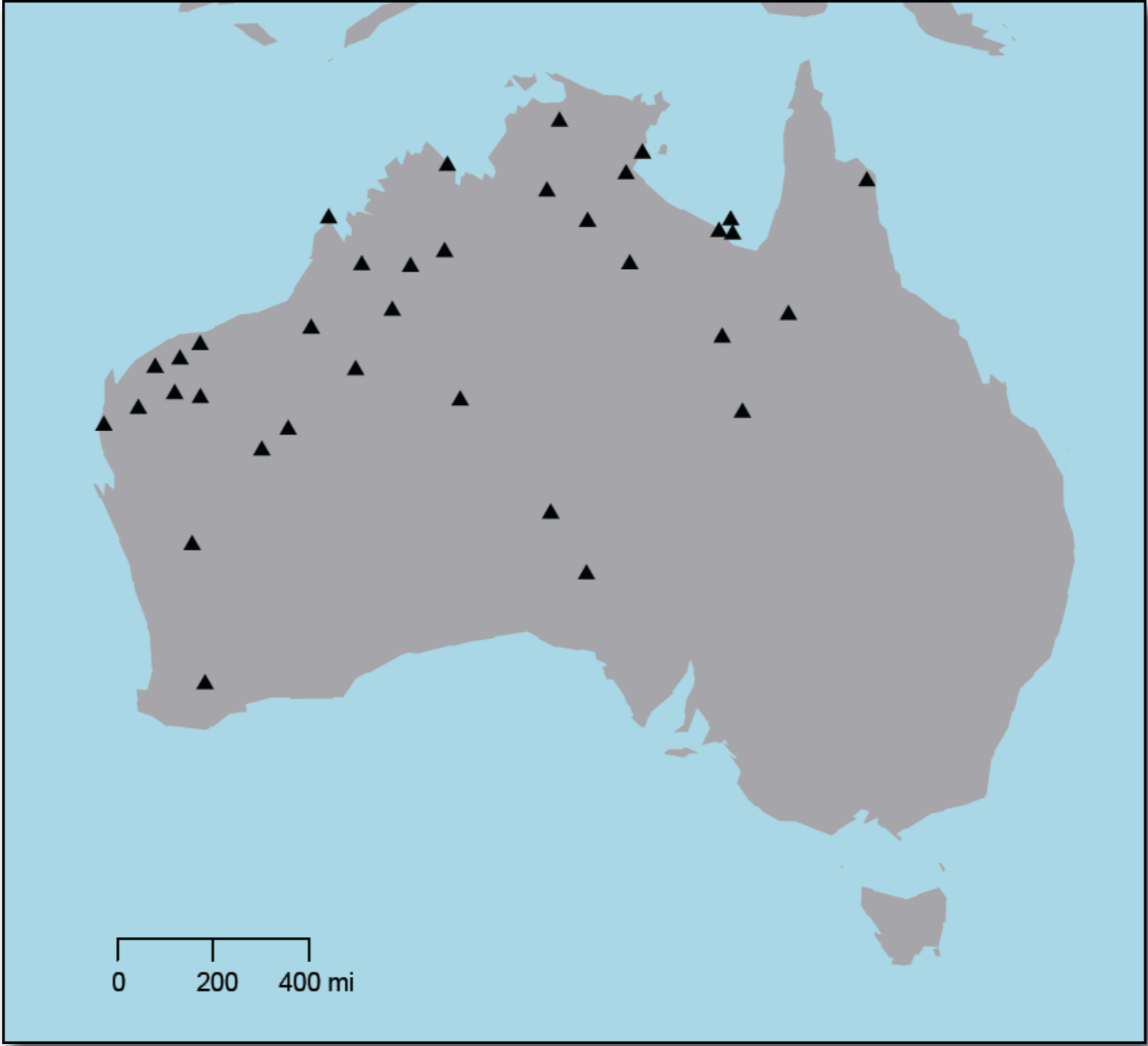
- Bardi
- Kukata
- Nyungar, Pintupi
- Umbugarla, Walmatjarri, Nyangumarta, Wambaya, Wardaman, Jingulu, Warnman, Watjarri, Yankunytjatjara, Nyigina, Kunin....

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- Kalkatungu, Badimaya, Payungu, Kariyarra, Kurrama, Martuthunira, Ngarluma, Panyjima, Putijarra, Kija, Guugu Yimidhirr, Ganggalida, Wubuy, Ngawun, Marra, Lardil, Kayardild, Jiwarli, Gooniyandi...

At a glance



Well-known properties of Australian languages

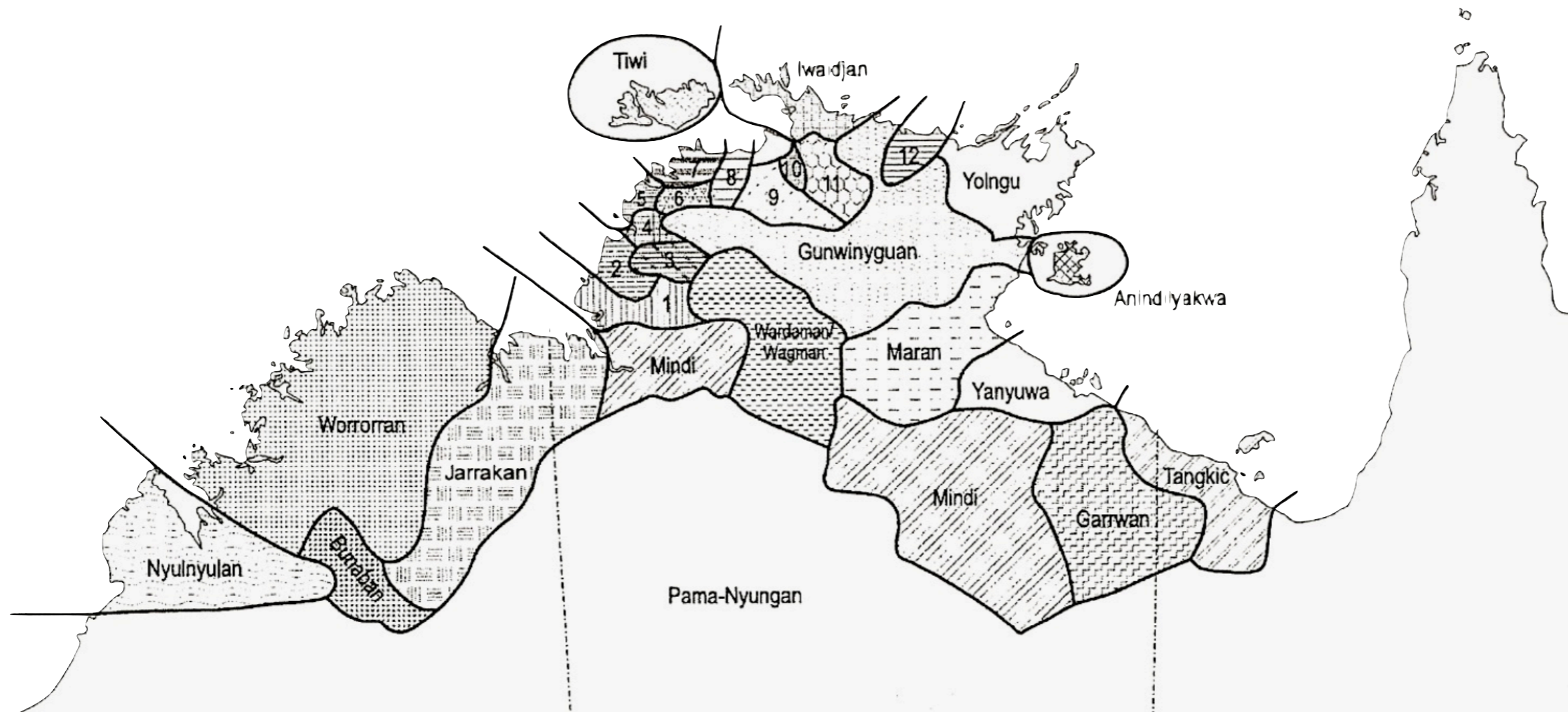
Australia

- ~250 languages
- 28 families
- Pama-Nyungan covers 7/8 of continent
- ~1/3 still spoken
- All endangered to some degree



Australia

- Other 27 (non-Pama Nyungan) families



Consonants

- Two striking facts
 - Phonemes inventories are remarkably similar
 - Certain cluster restrictions occur in almost all languages

Phonemes

Kalkatungu

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Coronal contrasts



Apicals



Laminals

Obstruents



Obstruent series



Fricatives

Obstruents



Obstruent series



Fricatives

Laterals



- Apical places (1 or 2)
- Laminal places (1 or 2)
- Obstruent series (1 or >1)
- Laterals (1 or >1)

Strongly recurrent patterns

- > 200 languages
- > 2000 miles
- 28 families
- an 'Australian Phonemic Profile'

Approaches to synchronic patterns

- Licensing by cue (Steriade 1999, 2001):

A contrast is more likely where the perceptual cues distinguishing it are stronger

- Enhancement gestures (Stevens et al. 1986, 1989, 2006, 2010)

Redundant gestures added to enhance the distinctness of a contrast

Approaches to synchronic patterns

- Feature economy (Clements 2003,2009)

‘Make maximal use of phonological features’

[labial]
[coronal]
[dorsal]
[nasal]

A		B	
E = 6/4 = 1.5		E = 5/4 = 1.25	
p	m	p	m
t	n	t	n
k	ŋ	k	

Inventories

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Phonotactics

- Common conditioning of laminals
- Articulatory
 - adjacent to /i/ : palatals only
 - adjacent to /a/ : dentals only
- Perceptual
 - before C : palatals only

Phonotactics

- Apical contrast neutralised in word initial position
- Maximises the perceptual distinction from other coronals
(Flemming 2004)
- Why the neutralisation in the first place?
 - cf Swiss German's word initial singleton–geminate contrast
 - future phonetic investigations may be enlightening

Phonotactics

- Constraints on consonant clusters
 - Manner of articulation:
liquid > nasal > obstruent
 - Place of articulation:
apical > laminal > dorsal > labial
- Apply within some domain

Phonotactics

- pt — tp — kt — tk

- Outside of Australia

(Brussels Flemish, Catalan, English, German, Korean, Lithuanian, Toba Batak, Yakut, Latin, Greek)

pt > tp

kt > tk

- Perception experiments (Jun 1996, Kochetov & So 2007)

Phonotactics

- Hamilton 1996 — 90 Australian languages

kt	1	Jingulu
tk	9	Alawa, Bularnu, Djaru, Jingulu, Mangarrayi, Miriwung, Muriny-patha, Ungarinyin, Wardaman
pt	2	Miriwung, Muriny-patha
tp	30	Alawa, Bidyara-Gungabula, Bularnu, Djambarrpuyngu, Djapu, Djaru, Gaagudju, Galpu, Gog-Narr, Jingulu, Kitja, Kuuku Ya'u, Mangarrayi, Marra, Murriny-patha, Ngalakgan, Ngandi, Nhukunu, Nunggubuyu, Olkol, Ritharrngu, Umpugarla, Ungarinyin, Uradhi, Wardaman, Warlmanpa, Warluwarra, Warndarrang,

What attested diversity can and can't tell us

Absolute markedness and typology

- Absolute markedness
 - how favoured or disfavoured a property is in human Language
- Typological prevalence
 - a fact about attested languages in the real world
 - what we're able know by observing actual languages
- Typological distribution

Absolute markedness and typology

- What is the significance of Australian phonological uniformity for our understanding of absolute markedness?
 1. Uniformity in Australia is due to chance
 2. The population which occupied Australia was genetically distinct
 3. The Australian Phonemic Profile is *highly* stable

Properties across time

- ‘Phonological property’

a language either has it
or not

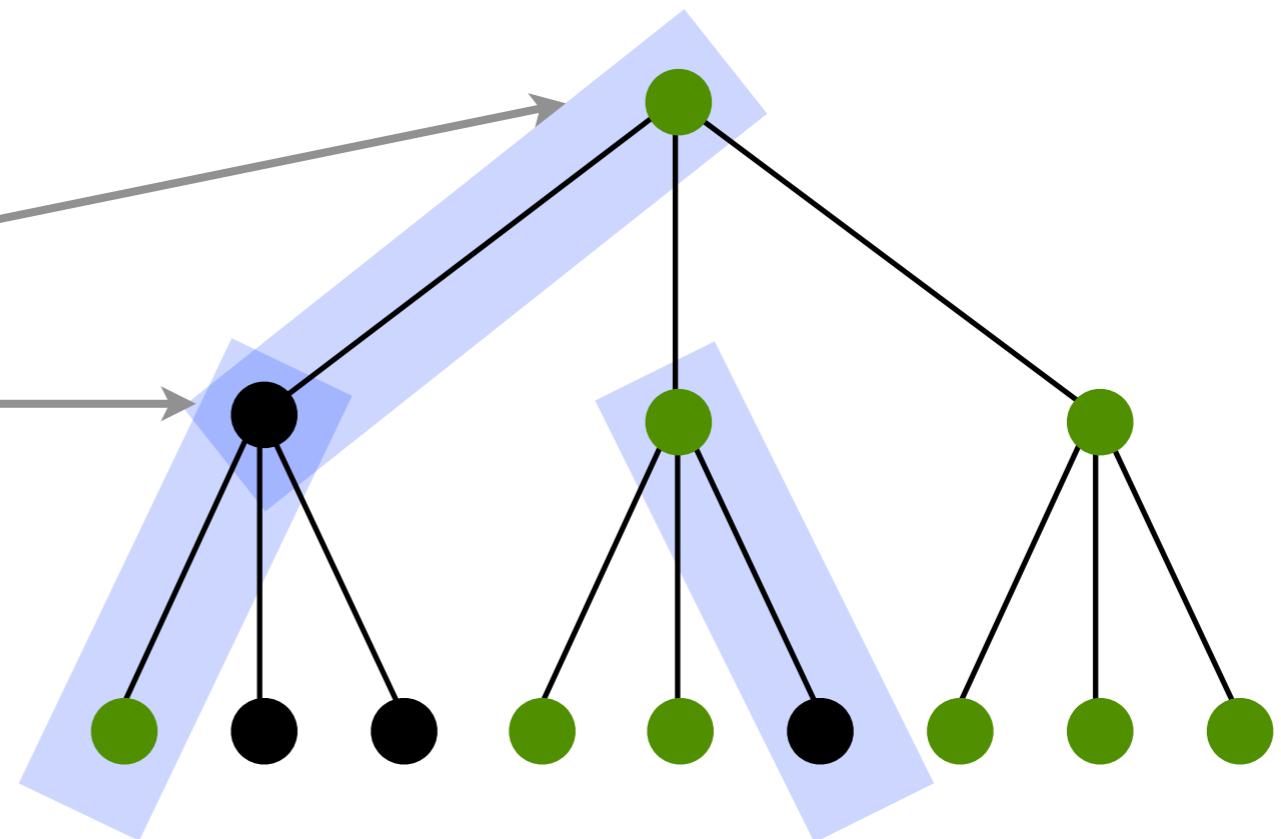
- has a triangular vowel system
- has two contrastive apical places of articulation
- lacks fricatives
- conforms to the Australian Phonemic Profile

Properties across time

- ‘Phonological property’

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or not

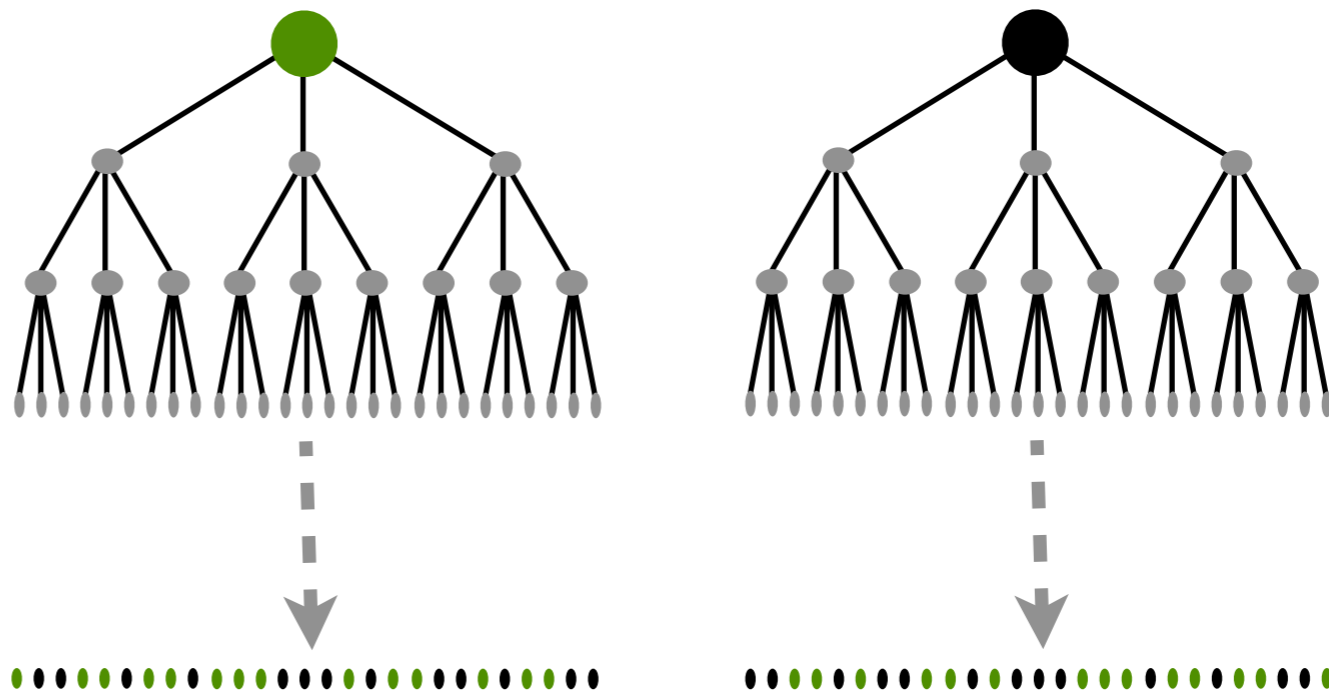


Properties across time

- $a = \Pr_{\Delta t} \left(\begin{array}{c} \bullet \\ \downarrow \\ \bullet \end{array} \right)$

- $b = \Pr_{\Delta t} \left(\begin{array}{c} \bullet \\ \downarrow \\ \bullet \end{array} \right)$

- $z = a + b$



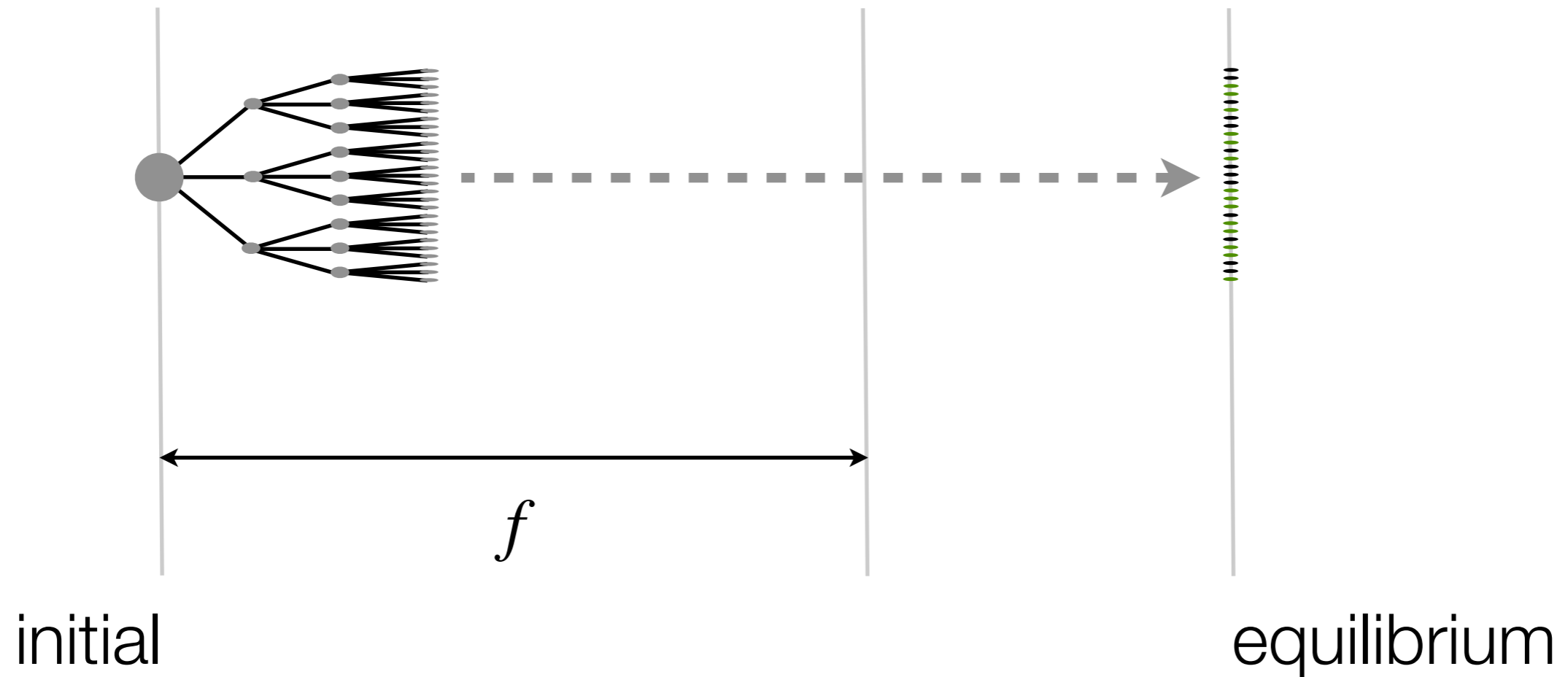
Equilibrium proportion of ● : $\frac{b}{z}$

$\frac{b}{z}$

Properties across time

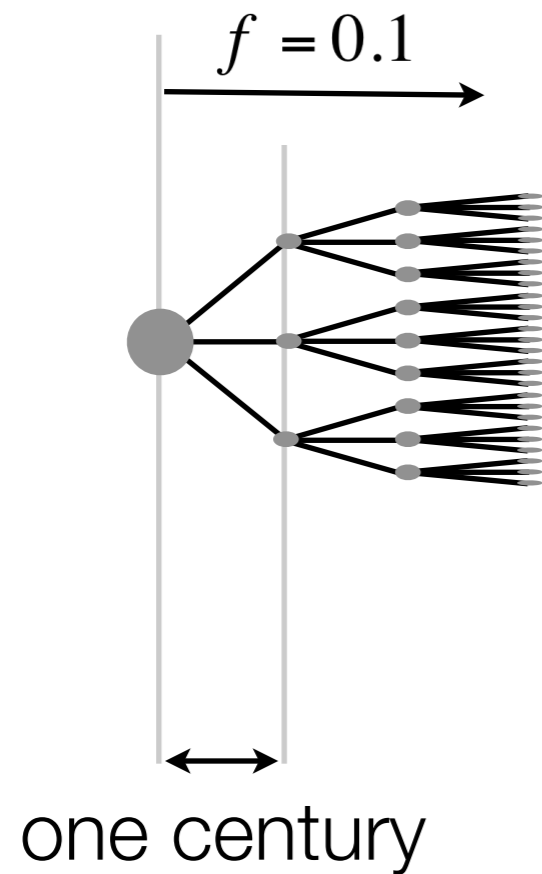
a	b	equil.
0.1	0.2	0.667
0.01	0.02	0.667
0.04	0.08	0.667
0.0003	0.0006	0.667

Properties across time



$$\Delta t_f = \frac{k}{\ln(1 - z)}$$

Properties across time



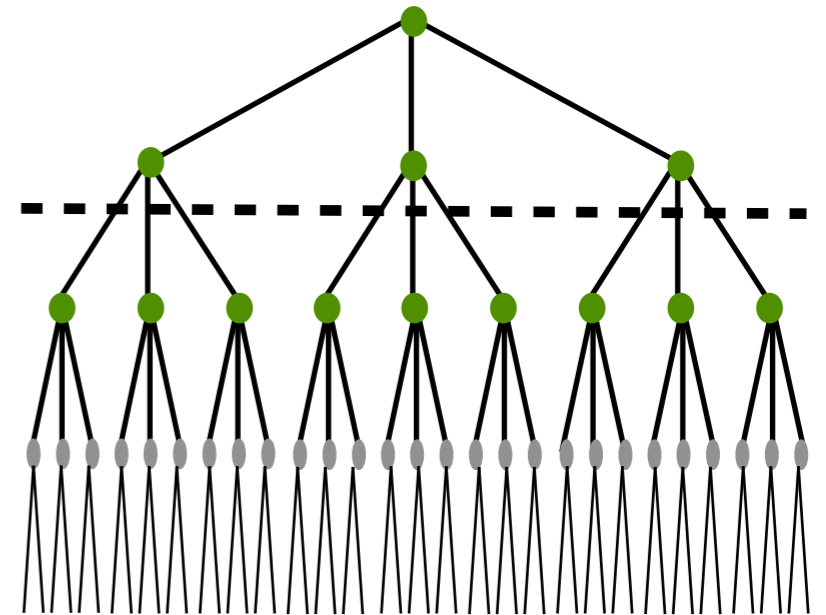
$z = a + b$	Δt_f
0.206	1,000 y
0.045	5,000 y
0.0228	10,000 y
0.0033	70,000 y

Consequent issues

- Typological distribution & prevalence
- Plausibility of *a* and *b*
- Role of language contact

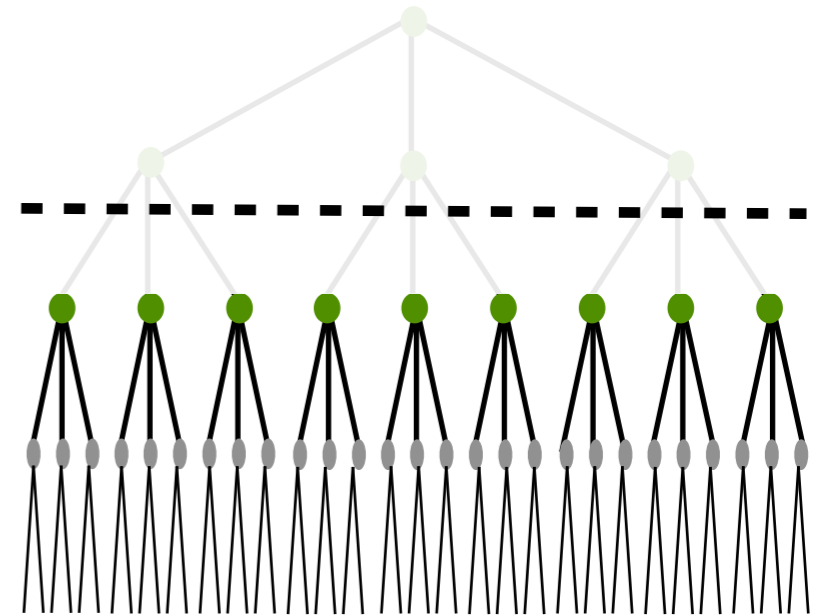
Typological distribution & prevalence

- Historical depth may exceed what we can uncover
- Comparative method: ~5,000 years



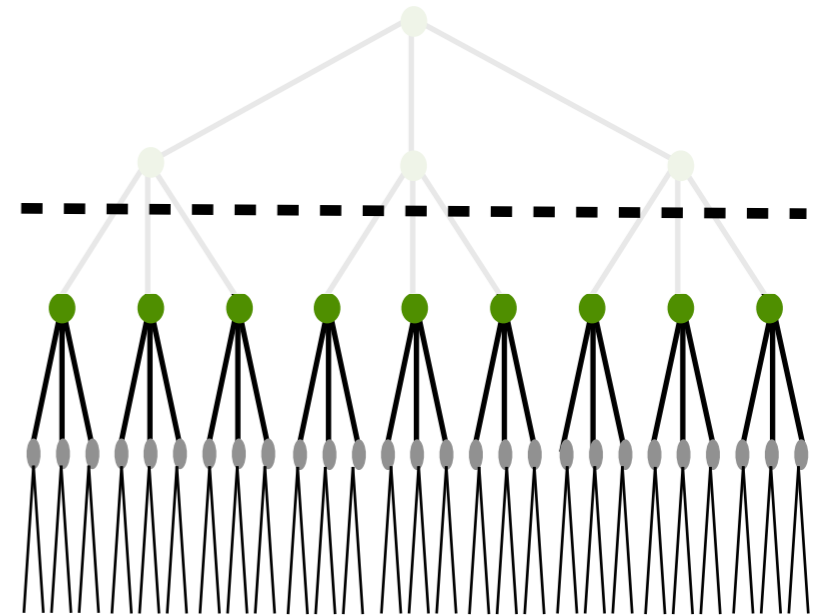
Typological distribution & prevalence

- For slow-changing properties, historical depth may exceed what we can uncover
- Comparative method: ~5,000 years
- Diagram appears to show a property found in many language families
- Distribution is reflective of accidents of human history, not the nature of Language
- We have an interest in detecting these properties for what they are



Typological distribution & prevalence

- If these languages are localised, the property appears like a 'localized universal'



Contact

- A property which is very slow changing (contact-free conditions)
 - parent and daughter languages differ rarely
- Add in contact
 - Now when they differ, most likely due contact
 - Noise of historical contingency is overwhelming signal from the human language faculty

What to do?

- Recognise that:
The process of looking at typological diversity and formulating hypotheses about the human language faculty is potentially fraught
- Start checking:
 - should we be concerned?
 - if so, which properties?
- A detailed typological investigation into the phonologies of Australia languages

Recent findings from Australian languages

Alternations

Kayardild

t	c	t̚	k	p	/ [-cont]__V	[-cont] = stops, nasals
ɹ	j	j	∅	w	/ [+cont]__V	[+cont] = others

Alternations

- Points of variation:
 - which stops
 - which more sonorous alternant
 - allophonic / phonemic
 - surface true / opaque

Alternations

	t	t	c	t̄	k	p
Wubuy	ɬj	r	j	ɬ̄	wj∅	wj∅
Kayardild	ɬ		j	j	∅	w
Mara	j		j		w∅	w
Wambaya	ɬ		j			wj
Gooniyandi			j	j	w∅	w∅
Bunuba			j	ɬ̄	∅	w∅
Yindjibarndi			j	ɬ̄	w∅	w
Warndarang			j		w∅	w
Mawng			j∅		w∅	w∅
Iwaidja			j		ɣ∅	w
Djambarrpuyngu				j	w	w