T. Mark Ellison

The Anti-Doppel Bias

Cognitive Processing, Behavioural Difference and Language Change

ARC CENTRE OF EXCELLENCE FOR
THE DYNAMICS OF LANGUAGE

The Wellsprings of Linguistic Diversity

Australian National University

in collaboration with

Luisa Miceli

CoEDL Affiliate, UWA

ARC CENTRE OF EXCELLENCE FOR
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THE UNIVERSITY OF
WESTERN
AUSTRALIA

LANGUAGE MONITORING IN BILINGUALS AS A MECHANISM FOR RAPID LEXICAL DIVERGENCE

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University of Western Australia

Recent studies have highlighted divergent change as a more common outcome of language contact than previously thought. While convergent change is often attributed to bilingual cognitive pressures, divergent change has usually been explained by appealing to sociocultural factors. We argue that the effects of social pressures on linguistic systems must nevertheless be realized in how language is processed in the individual bilingual speaker and, therefore, that divergent change is also ultimately rooted in bilingual cognition. Since lexical forms are most susceptible to contact-induced divergent change we focus on their production. We begin by developing a cognitive model that combines Grosjean's language mode with a later output-monitoring stage. The pa-

rameters to the model are then fit to the results of an experiment in which bilinguals are seen to

orm the basis of a series of multi-agent sim-

nguages with large proportions of bilinguals.

e psycholinguistic study of bilingual lexical

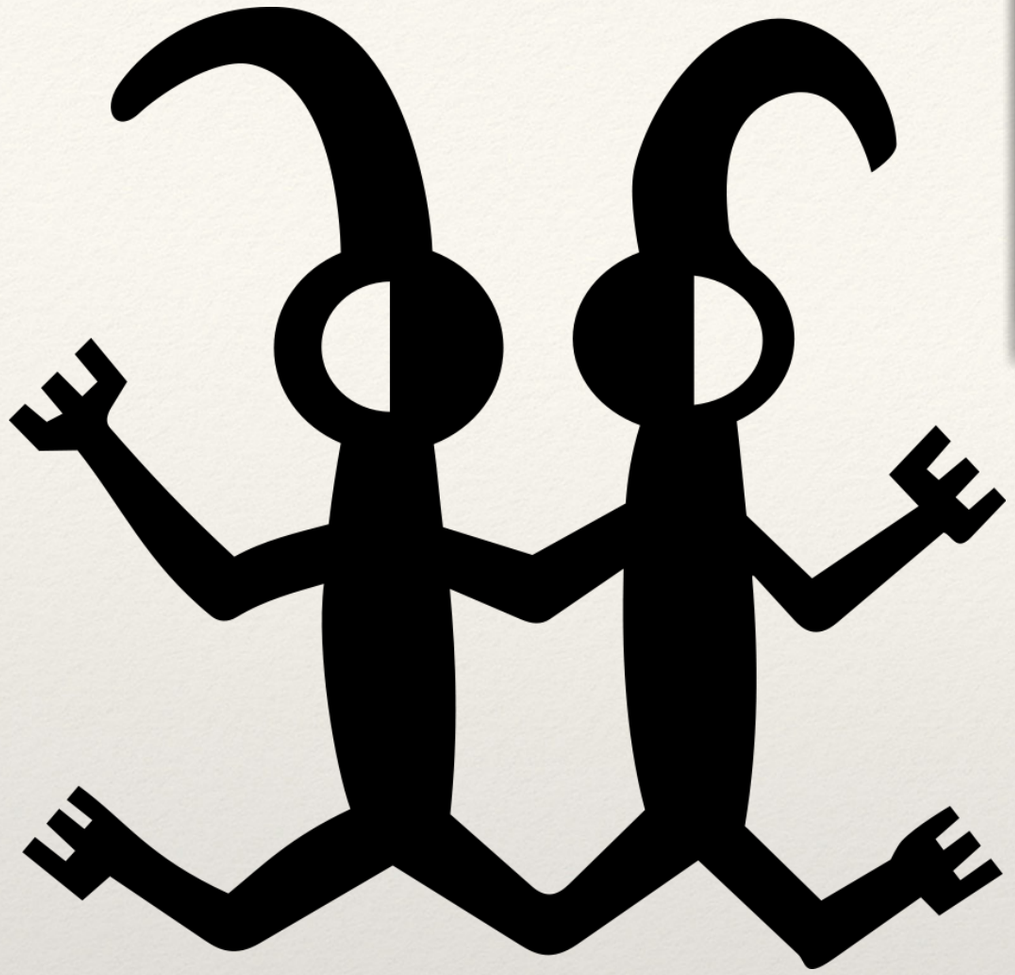
selection, the construction of phylogenies, and the reconstruction of language family histories.

Ellison, T.M. & L. Miceli (2017) **Language Monitoring in Bilinguals as a Mechanism for Rapid Lexical Divergence**, *Language*. 93(2):255-287.

Language (2017)

Monitoring, Bilingualism, and Language Divergence

Processing



ALS 2012, Language 2017

- a **DOPPEL** is a form-meaning pair that is recognisably similar across 2 or more languages

	Cognate	Non-Cognate
Doppel	EN: **water** NL: **water**	EN: **information** PL: **informacja**
Non-Doppel	EN: **two** HY: **երկու** (erku)	EN: **sky** NL: **hemel**

Doppels

- Note that **doppels** are called **cognates** in applied- linguistics and psycholinguistics

Processing

Dutch: **foto**

English: picture, **photo**

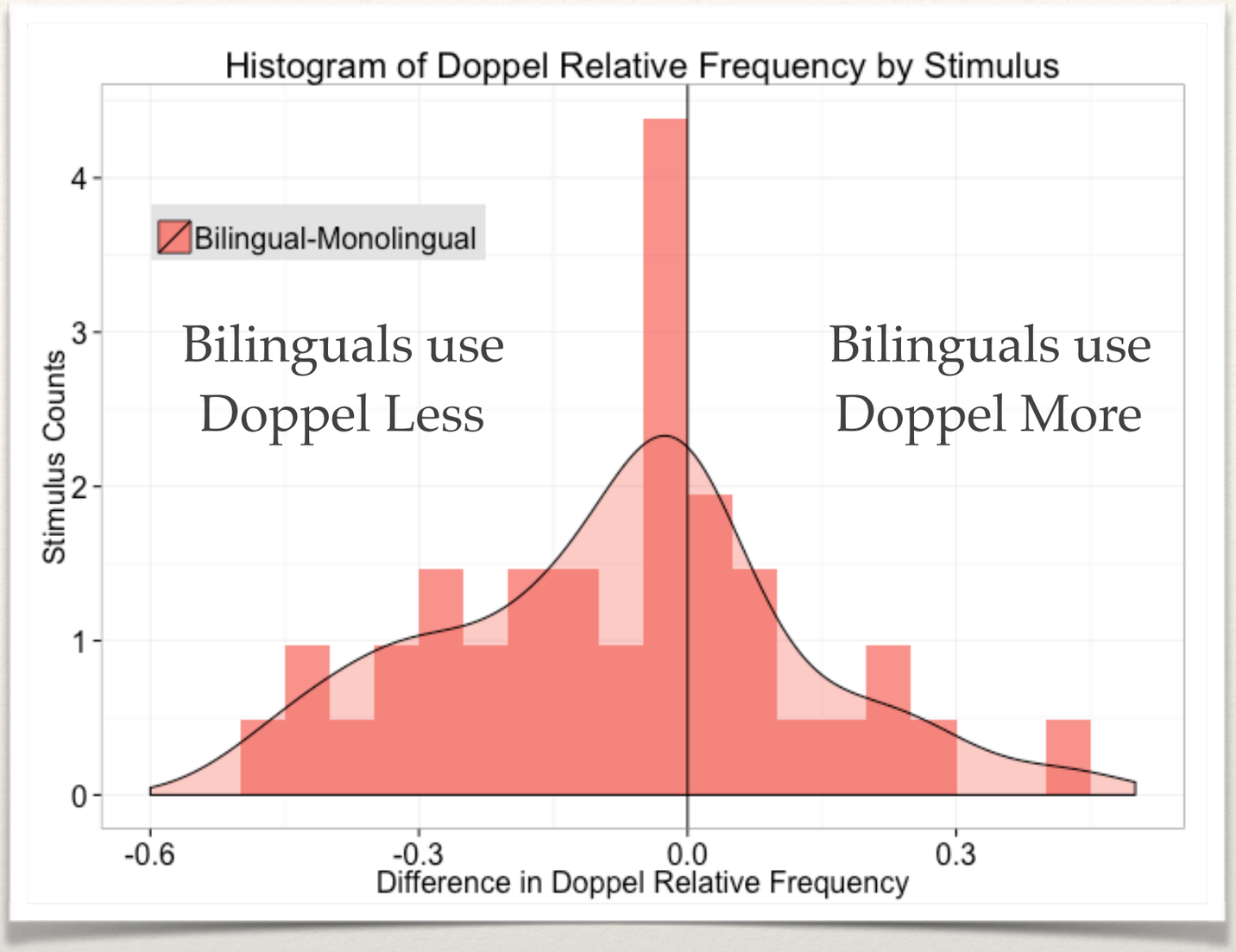
Which English word will Dutch-English bilinguals choose (relative to what monolinguals prefer)?

ALS 2012, Language 2017

Bilingual Behaviour

Processing

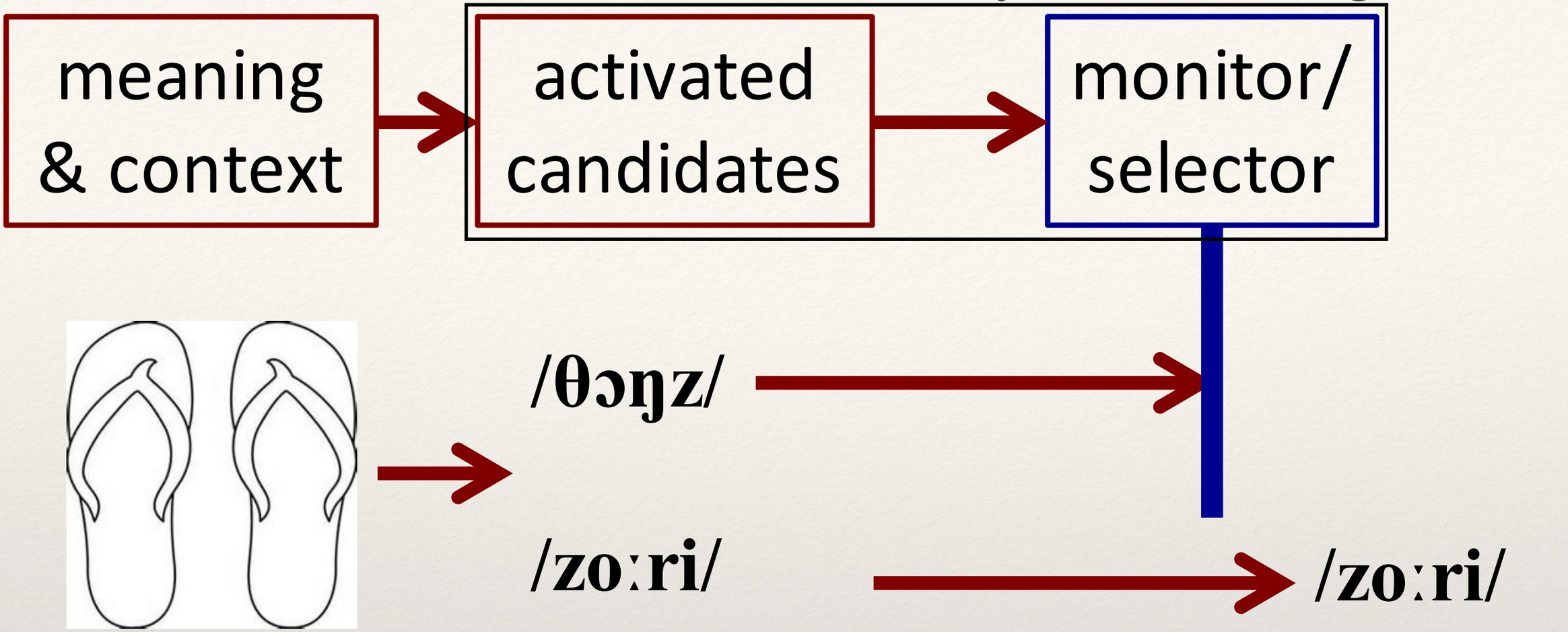
Bilinguals use doppels less frequently than monolinguals



ALS 2012, Language 2017

Bilingual Behaviour

Processing



ALS 2012, Language 2017

Activation and Monitoring

Processing

$$P_G(f \mid s;\, t,b) = (1-b)\, P_{2M}(f \mid s;t) + b\, P_{BM}(f \mid s)$$

$$P_L(l \mid f,s;\, t,p_G,m) = m\, k_L\, P_M(f \mid s;l) + (1-m) \,/\, |L|$$

$$P_C(f \mid s;\, t,b,m) = k\, P_L(l{=}t \mid f,s;\, t,b,m)\, P_G(f \mid s;\, t,b)$$

Comparative Australian Languages Workshop 2015, Language 2017

Model of Bilingual Lexical Selection

Processing

Picture-naming tasks show a doppel ***advantage*** (faster response times)

- e.g. Costa, Caramazza, & Sebastian-Galles (2000)

which apparently ***conflicts*** with anti-doppel bias: which inhibits shared vocabulary

Picture-Naming Quandary

Processing

But these experiments:

a) minimise ambiguity in stimuli

b) disregarded non-target responses

Picture-Naming Quandary

Processing

Transdisciplinary and Innovation Grant Application

Please note we require the minimum font size to be 11pt (Arial)

Applicant Name:	T. Mark Ellison
University/Institution:	Australian National University
Relevant Programs and/or Threads:	Evolution, Processing, Shape
Chief Investigator & Administering Institution:	Paola Escudero (Learning/Processing), Western Sydney University
Other Centre Collaborators & Institution: (all collaborators need email confirmation of involvement to coedl@anu.edu.au)	Luisa Miceli (UWA, affiliate from 2016) Simon Greenhill (Evolution), ANU Niels Schiller (Leiden University, affiliate from 2016)

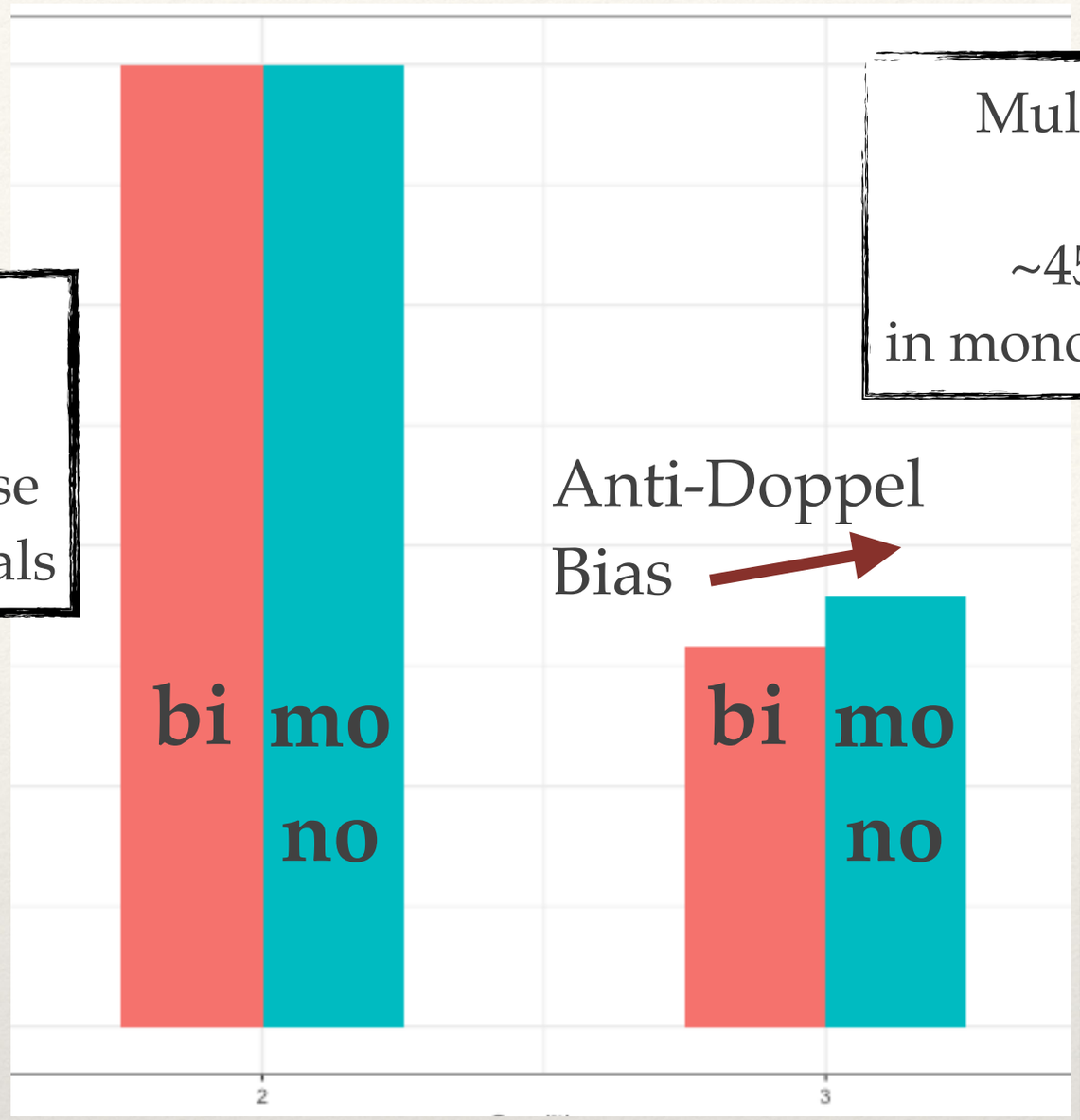
Title of Project: Picture-Naming, Synonymy and Language Divergence in Bilinguals

TIG & now continued by UWA Collaboration grant to Luisa Miceli

Picture-Naming & Options

Processing

Single Answer:
Doppel
100% Doppel Response
in mono- and bi-linguals



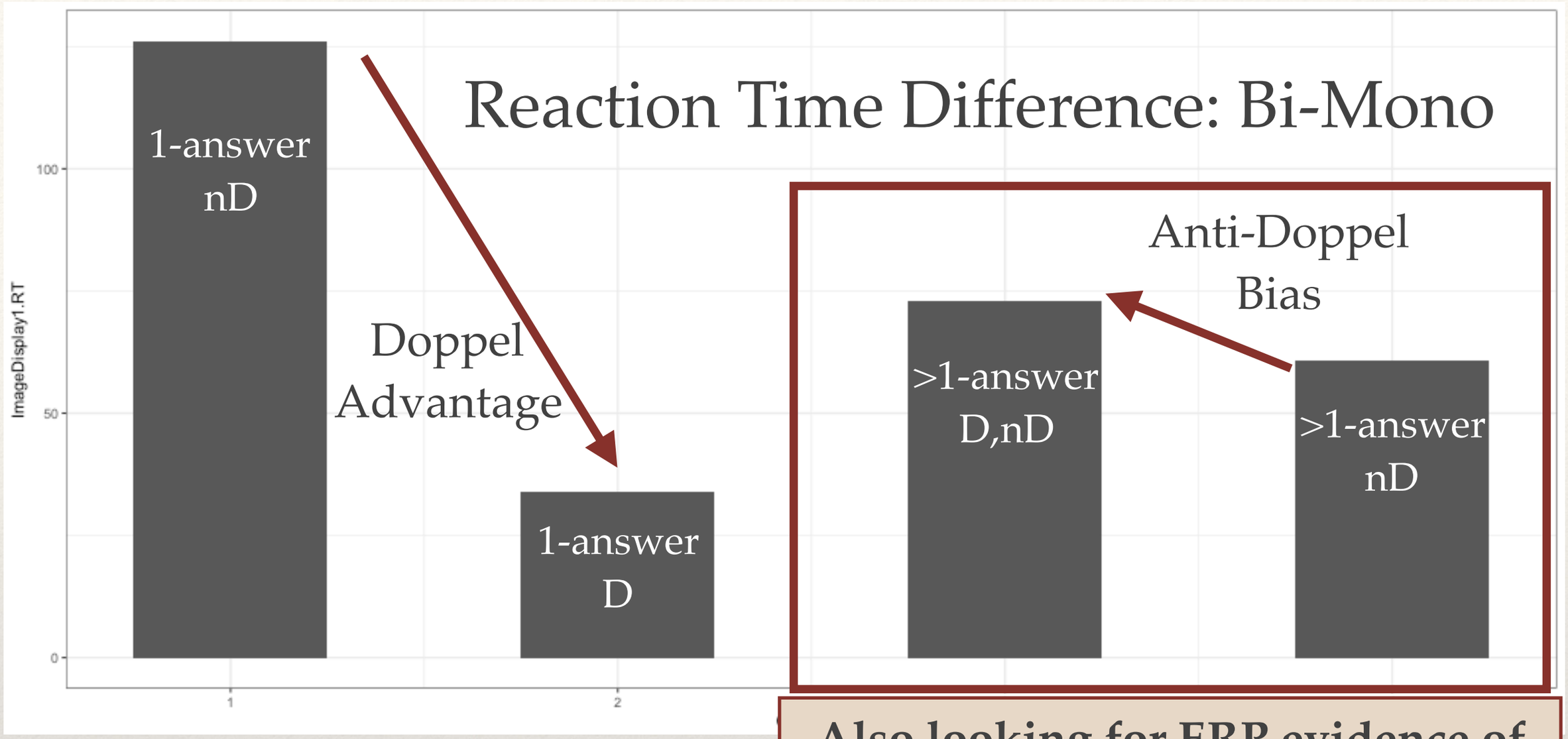
Multiple possible answers
including Doppel
~45% Doppel Response
in mono- and ~40% in bi-linguals

Replicates selection result from previous study

Behavioural Results - Replication of Behavioural Choice

Picture-Naming with Options

Processing



Also looking for ERP evidence of conflict-triggered monitoring

Behavioural Results - Impact on Reaction Time

Picture-Naming with Options

Processing

Contact (bilingualism)
leads to
Convergence

Lexical Convergence | Shape

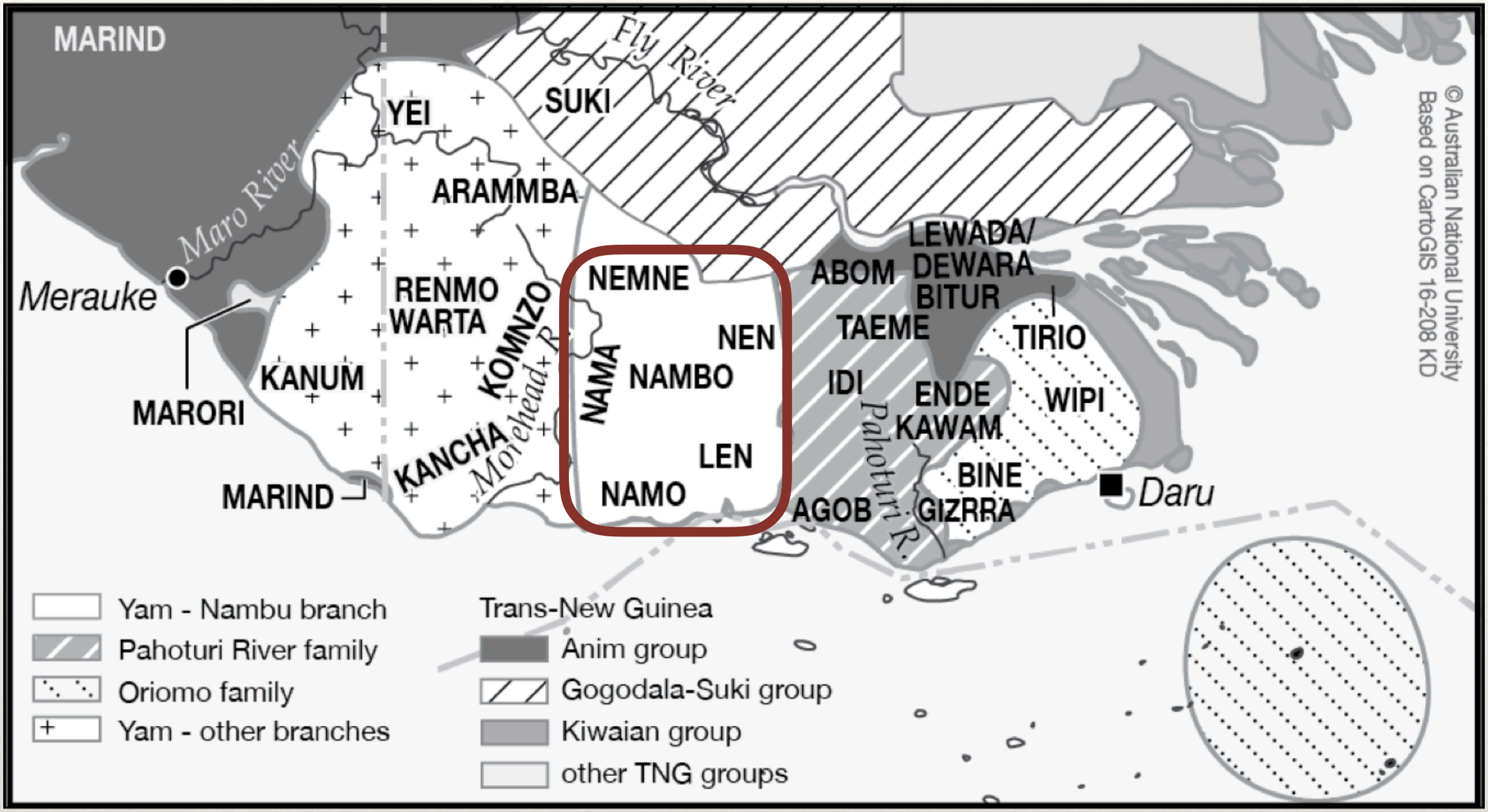
The Wellsprings of Language Diversity

- why do we have linguistic diversity hotspots?
- can bilingualism lead to lexical diversity?

ALS 2017

Lexical Convergence

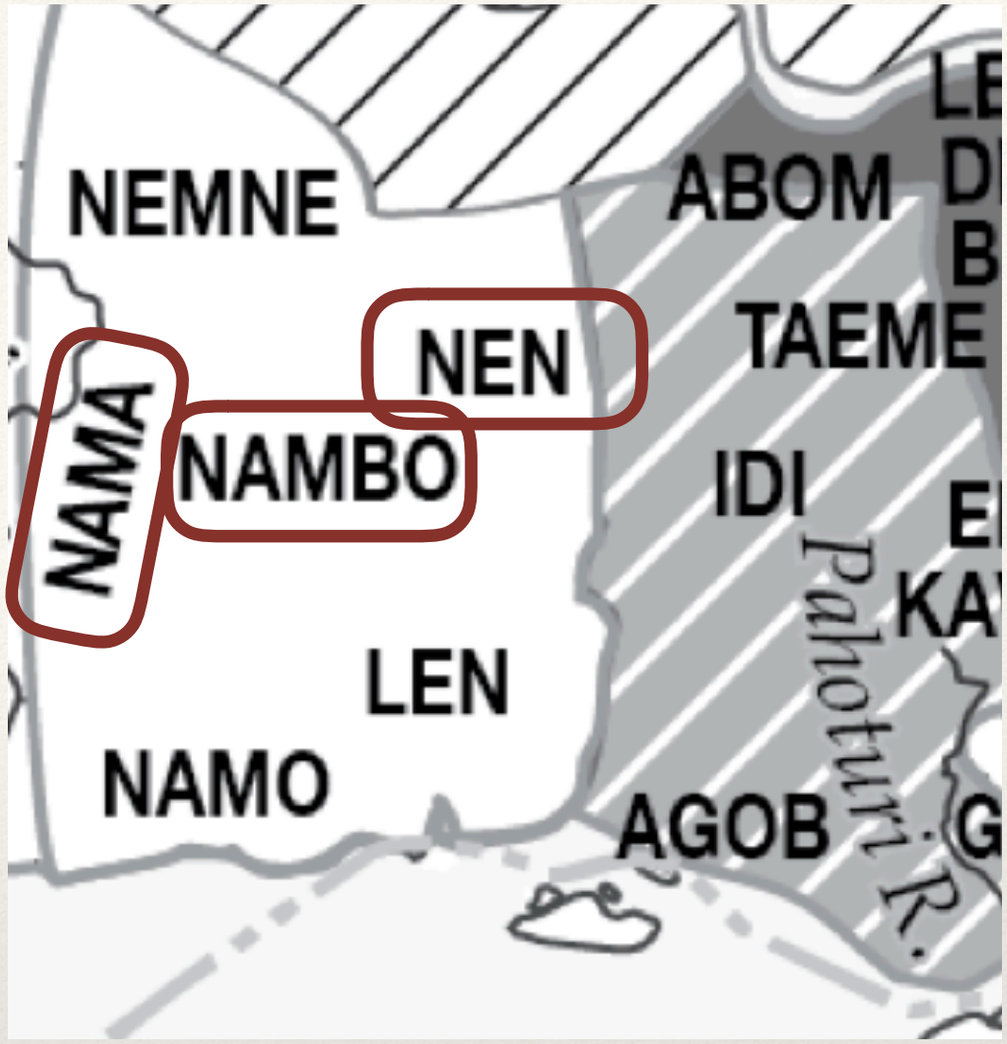
Shape



Lexical Convergence

Shape

- Presentation: ALT 2017
  Diachronic typology meets contact typology: a regional case study from Southern New Guinea
- long-term stable bilingualism



ALS 2017

Lexical Convergence

Shape

	Nama	Nmbo	Nen
Lexicon			
Grambank Measure			
Nominal Morphology			
Pronouns			

FORM

STRUCTURE

Lexical Convergence

Shape

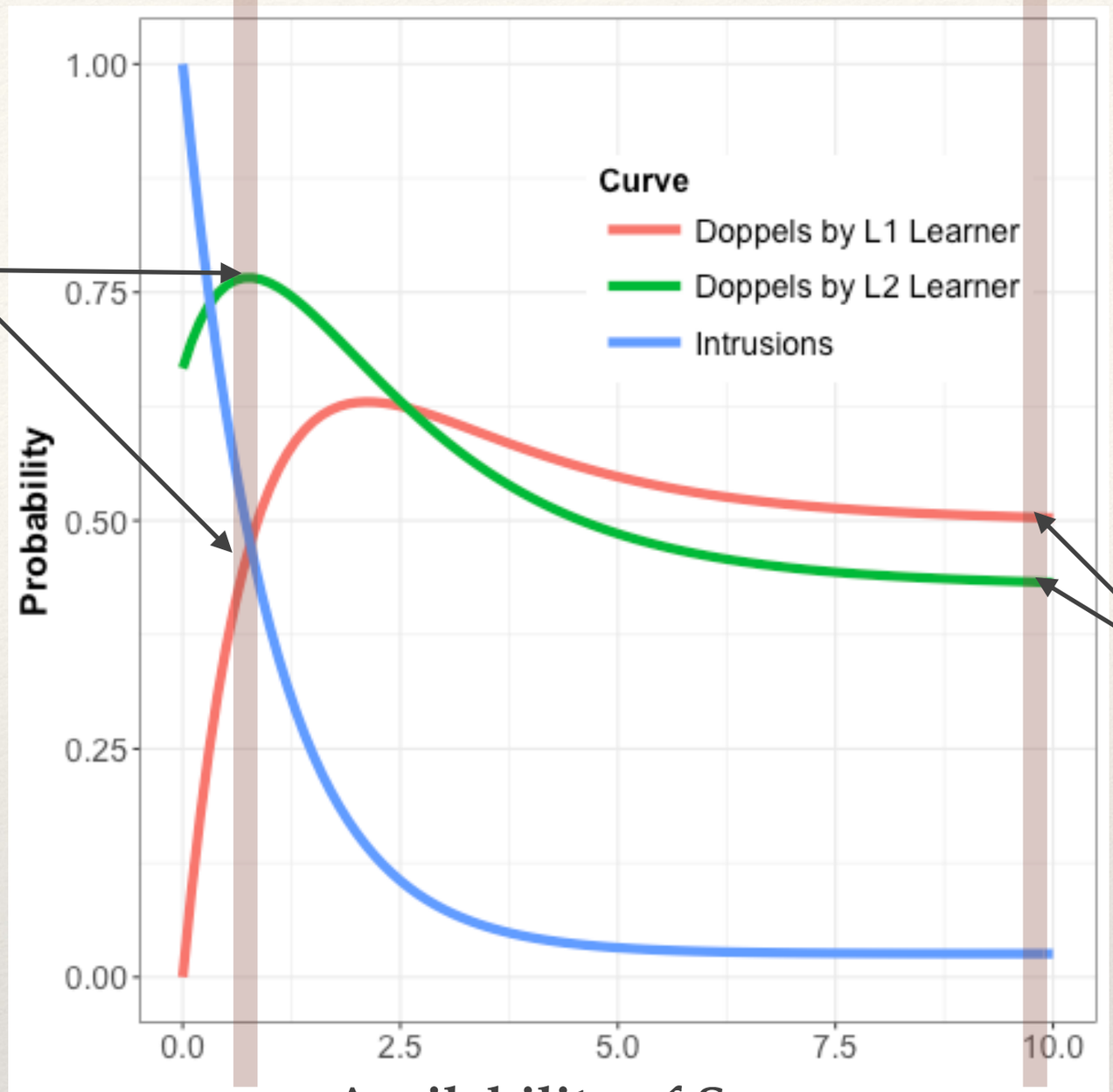
Contact
leads to
Convergence (Structure/Lexicon)
and/or
Divergence (Lexicon)

Language 2017

Lexical Convergence

Shape

Weak learners with few options use doppels more than monolinguals

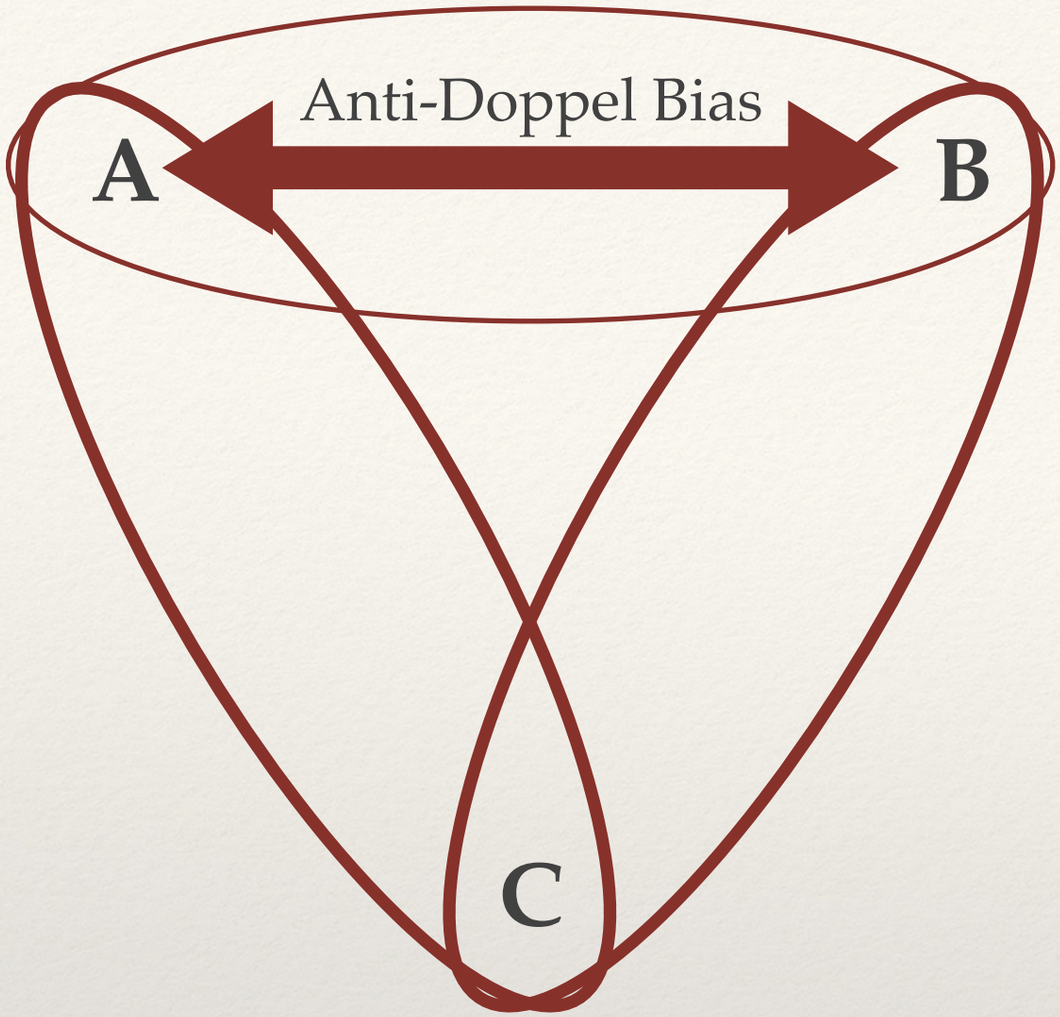


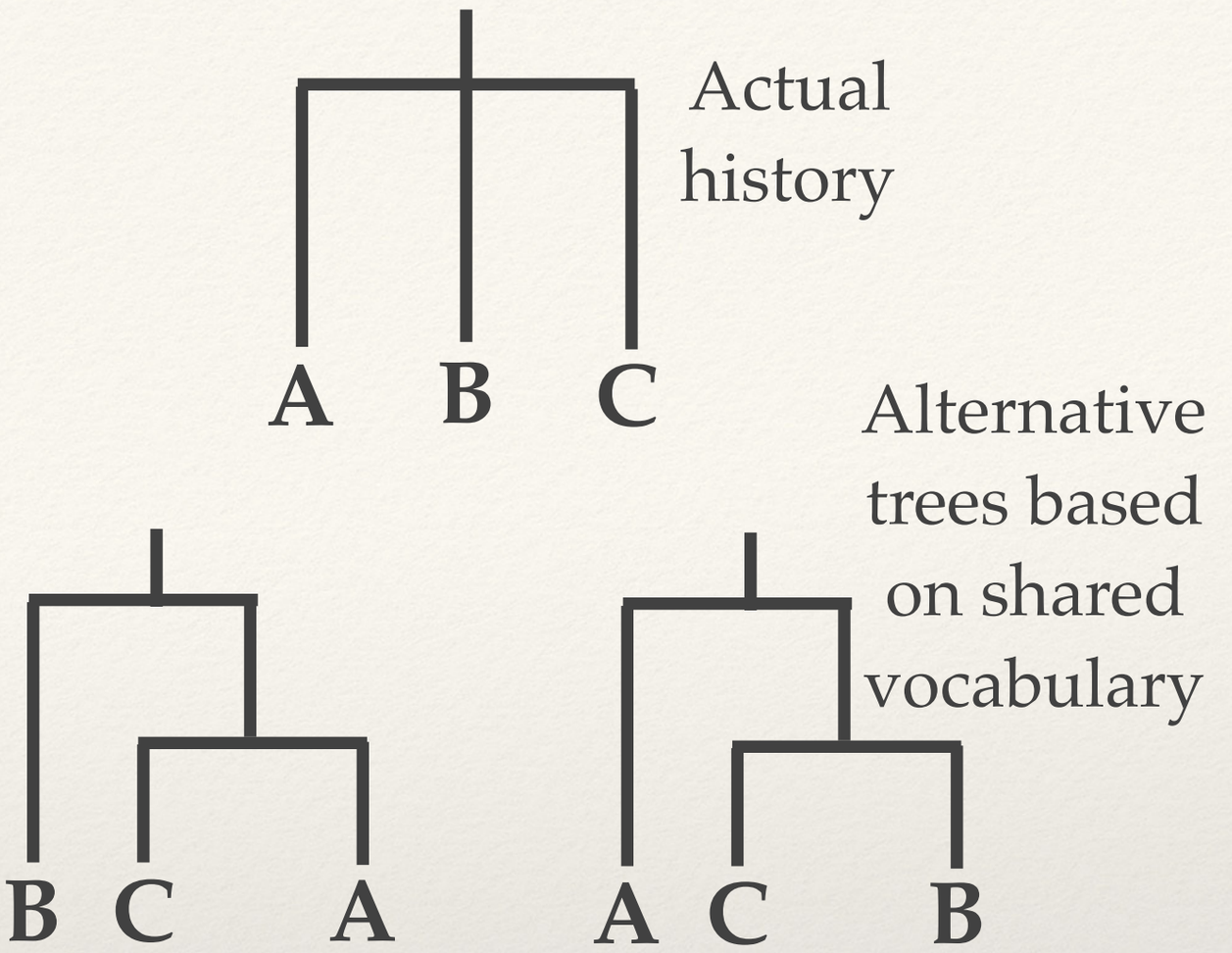
Strong learners with more options use doppels less than monolinguals

ICHL 2017

Weak and Strong Learners

Learning

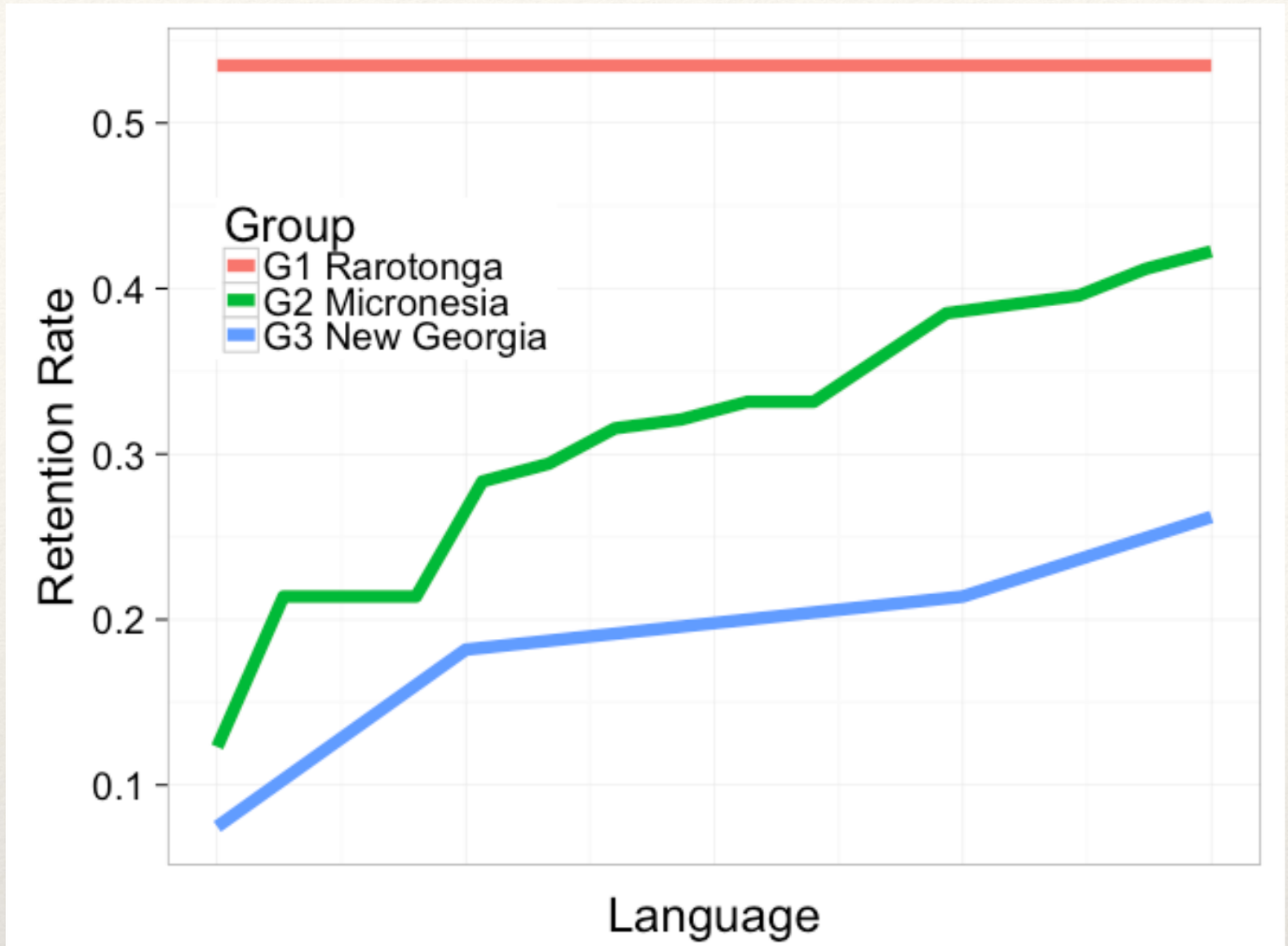




ICHL 2015 Workshop: Non-cladistic approaches to language genealogy

Arboreal Problems

Evolution



inter-language contact

Languages in contact lose more vocabulary

Miceli et al. (2016) ALS

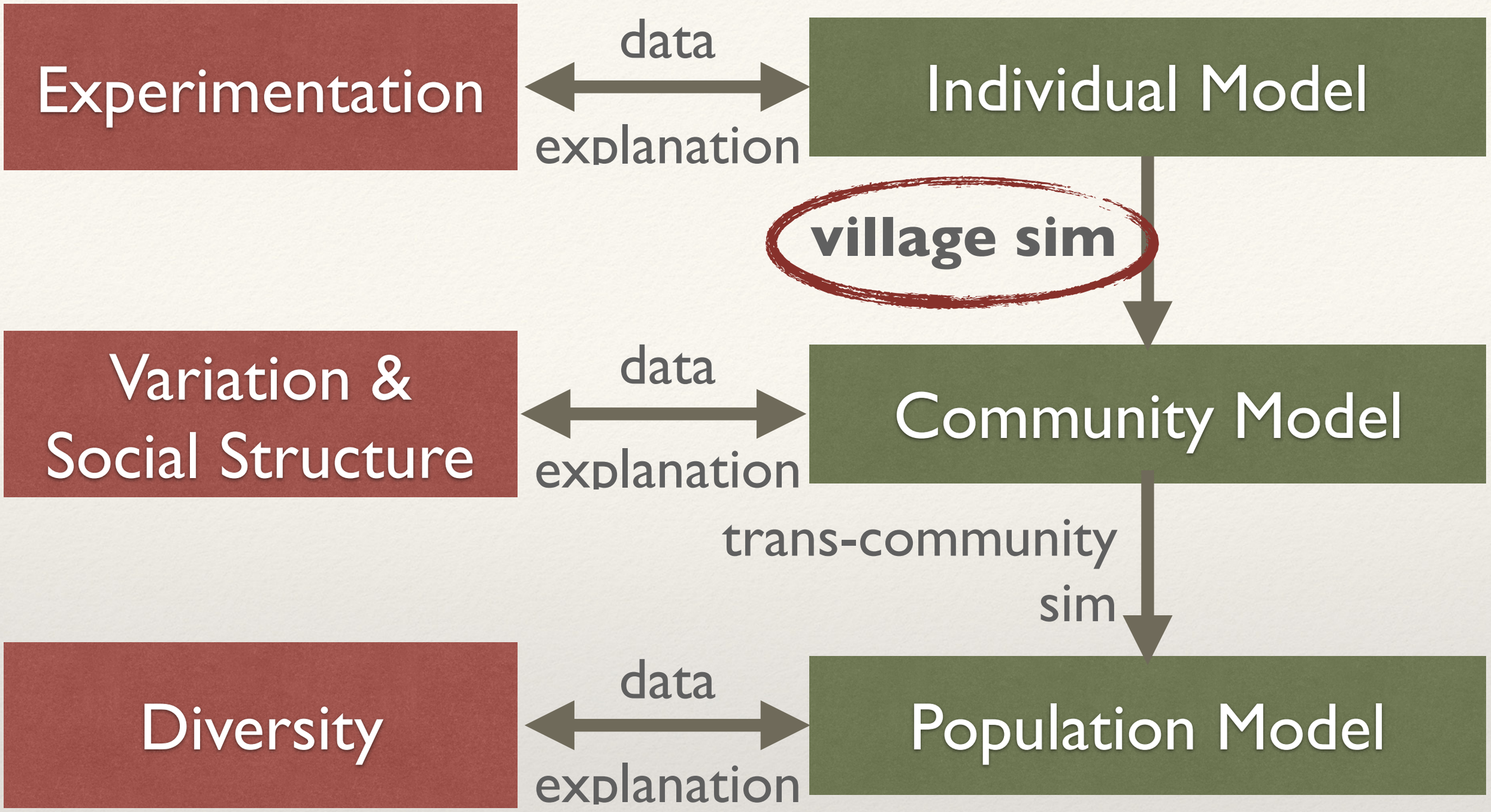
Divergence in Oceania

Evolution

egocentrism
iconicity
frequency
identity
prestige
sentence interpretation &
configurationality

Future Work: adding to individual model

All



Future Work: close agent-based models

Ellison & Kashima (2018) EvoLang

All

Thanks!	Doppel	Non-Doppel
Cognate	[daŋkə]	[tʰøʰk]
Non-Cognate	[tʰæŋk]	[d͡ʒẽki]

http://bld.markellison.net/

Bilingualism-Led Divergence

Publications

Ellison, T.M. & L. Miceli (2017) **Language monitoring in bilinguals as a mechanism for rapid lexical divergence,** *Language*.

Ellison, T.M. & L. Miceli (2012) **Distinguishing Contact-Induced Change from Language Drift in Genetically Related Languages**. *Proceedings of the EACL Workshop on Computational Models of Language Acquisition and Loss*.

Presentations

Ellison, T.M. & L. Miceli (2017) **The Impacts of Bilingual Production Monitoring on Non-Dominant Language Lexica**. ICHL.

Ellison, T.M. (2017) **Experimental semiotics, representational biases and the atoms of language change**. ICHL (workshop on Atoms of Language Change).

Miceli, L. et al. (2016) **Can we identify bilingual-led lexical differentiation in Oceanic?** ALS.

Ellison, T.M. & L. Miceli (2015) **Does Grosjean's Language Mode require Variable Language Activation?** ALS.

Ellison, T.M. & L. Miceli (2015) **Language Discontinua: how Bilingual-Led Differentiation Disrupts Cladistic Modelling**. ICHL.

Ellison, T.M. & L. Miceli (2015) **A Cognitive Model of Bilingual-Lead Differentiation and Convergence.** Comparative Australian Languages Workshop.

L. Miceli & Ellison, T.M. (2015) **Looking for evidence of an anti-doppel bias in the Pilbara**. Comparative Australian Languages Workshop.

Ellison, T.M. & L. Miceli (2013) **New Perspectives on Language Change: L2 Transmission and the Cognitive Basis for Contact-Induced Differentiation of Lexical Forms**. ICHL.

Ellison, T.M. & L. Miceli (2012) **A cognitive model of contact-induced differentiation**. ALS.

Ellison, T.M. & L. Miceli (2009) **Less-than-chance Similarity & Language Differentiation.** ALS.