Differential preference in the choice of nominal classification rules in Kîîtharaka

Patrick Kanampiu[1], Alexander Martin[2], Jennifer Culbertson[1]

WOCAL 11

August 6th, 2024

[1]University of Edinburgh
[2]University of Groningen

university of groningen

Grammatical gender systems

- Systems that group nouns based on nominal agreement (see e.g., Hockett 1958, Corbett 1991, Guldemann & Fiedler 2019)

French

1.	le	ballon
	the.M	Ball.M
2.	la	Camionnette
	the.F	van.F

Kîîtharaka

3.	mu-ntû	û-mwe
	1-person	1-one
4.	ka-buri	ka-mwe
	12-kid	12-one

Grammatical gender system are complex

- Gender agreement mainly depends on meaning and formal cues of the noun:
  - The different cues (prefixes or suffixes, semantic or formal) differ in reliability (see e.g., Karmiloff, 1981; Gagliardi & Lidz , 2014)
  - Sometimes there is no overlap between cues (semantic and formal) and agreement (i.e., exceptions)

	meaning	**form**	
3.	mũ-rĩtû	ũ-mwe	1-person
4.	î-the	û-mwe	5-father
5.	prî-pôria	kî-mwe	7-prophet
6.	thaa	î-mwe	watch
	1-one	1-one	
	5-	1-one	
	7-one	9-one	

- There are novel/loan nouns without formal features

State of the art

- Previous studies have sought to establish:
  - Which rules are productive for gender assignment in specific languages (see e.g., Enger 2009, Morin 2010, Mastropavlou & Tsimpli 2011, Del Tomba 2023, Kanampiu et al. 2024)
  - How nouns that do not conform to gender assignment cues are treated (see e.g., Rabeno & Repetti 1997, Demuth 2000, Van de Velde 2006, Melissaropoulou 2016, Mar ía del R ío-Gonza Íez 2021)

State of the art

- Interaction between gender assignment cues of different types (see e.g., Karmiloff 1981, Kilarski 2003, Nesset 2006, Enger 2009, Thornton 2009, Gagliardi & Lidz 2014)

- Some of these (influential) experimental studies have established:
  - Developmental difference: children acquiring noun classes, unlike adults prefer to use formal cues (e.g., phonology) even when more statistically reliable semantic cues are available (e.g., Karmiloff 1981)
  - Adults more likely to use semantics (Culbertson et al. 2017, 2019)
    - But are sensitive to highly salient formal cues as well (e.g., Frigo & McDonald 1998, Culbertson et

The aim of the current study

- Focus on gender assignment Kîîtharaka (Bantu, E54)
  - Relatively little prior research using psycholinguistic methods to evaluate cues that learners/speakers find productive
  - Gender in Bantu languages differ (mainly) from I.E counterparts in important ways
    - Many genders/classes genders involved (2-22)
    - Ubiquitous nominal prefixes and rich prefixal agreement morphology

Do speakers and learners of these languages show consistent preference for given cue types?

Sesotho (Demuth 2000; corpus-based study):

- Children acquiring noun classes mainly rely on nominal prefixes
- Evidence in adults come only from loan words
- Open question: Do adults use form more productively than meaning?

Do speakers and learners of these languages show consistent preference for given cue types?

Kinyarwanda (Jerro et al., Under review); experimental study):

- Tested whether speakers categorize nouns based on morphology or meaning
  - Based on a triad task; participants given sets 3 nouns sharing meaning, morphology or neither, and asked to select the most different
  - Participants were more likely to group nouns based on meaning but were more likely to use morphology if they spoke Swahili.
- Did not directly address productive use of cues in classifying novel nouns

Do speakers and learners of these languages show consistent preference for particular cue types?

Kîîtharaka (Kanampiu et al., in print); experimental study):

- Investigated whether adult speakers of Kîîtharaka productively use semantic and morphophonological cues in novel nouns to determine gender agreement
  - All formal features tested were productive
  - Only a subset of semantic features (e.g., Human, fruit, narrow, evaluative meaning) were productive
- Did not investigate whether speakers rely on meaning or form *when they conflict – i.e., which takes priority?*

The Kîîtharaka gender system

Gender	Traditional class pairs	Form class prefixes	Agreement class prefixes
A	1	mû-	û-
	2	a-	ba-
B	3	mû-	û-
	4	mî-	(y)î-
C	5	î-	rî-
	6	ma-	ma-
D	7	k(g)î-	k(g)î-
	8	i-	bi-
E	9	n-	î-
	10	n-	(c)i-
F	11	rû-	rû-
	10	n-	(c)i-
G	12	k(g)a-	k(g)a-
	13	tû-	tû-
GAC	14	û-	bû-
H	16	ba-	a-
	17	k(g)û-	k(g)û-

- Typical of Bantu gender system, from Indo-European systems
  - Many classes: 8 genders (sing/plural pairs)
  - Ubiquitous nominal prefixes
  - Rich agreement morphology
  - Semantic heterogeneighty (see,e.g., wa Mberia,

An experimental investigation of conflicting cues in Kĩĩtharaka

- Current study investigated what cue types speakers of Kîîtharaka rely on when both conflict
- Previous studies (non-Bantu) found that participants may prefer certain cue types based on:
  - Cue (statistical) reliability, relative salience (Gargliardi & Lidz, 2014, Culbertson et al. 2017)
  - Cognitive biases e.g., tendency to form categories based on *core knowledge* (Strickland 2017, Meir et al. 2017)
    - Even in infancy, learners are primed to classify entities in certain ways (e.g., mass/kind-; animate/inanimate distinctions)

Methods

Materials

- The experiment included visual and linguistic stimuli (orthographically presented)
- Participants saw an image depicting a target semantic feature followed by a descriptive phrase in a carrier sentence e.g.,

a Kîîtharaka speaker saw *'mûkithe __mwe.'*

Semantic feature	**morphophonological feature**	
	Aligned	*Conflicting*
Human	**mû-**	rû-, û-
Augmentative	**î-**	mû-, n-, rû-, û-
Pejorative	**gî-**	

Aligned: prefix cues same class as meaning

Conflicting: prefix cues different class from meaning

Methods

Procedure:

- Administered via Qualtrics
- Four blocks: Human, Augmentative, Pejorative, Diminutive
- Image appeared along with critical prefix+stem
- Participants were asked to provide missing agreement on numeral ‘one’

Participants:

- 44 native speakers of Kîîtharaka (students of Tharaka University, Kenya)

Sample trial: Human block

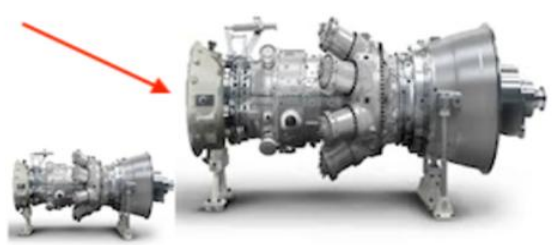
"This picture shows: [mû-]"police"

"A Kîîtharaka speaker saw: rûtinki _one"

e

Sample trial: Evaluative blocks

"A Kîîtharaka speaker saw: mûkero _one"



"This picture shows: mû-kero

(a) Augmentative

Sample trial: Evaluative blocks

"A Kîîtharaka speaker saw: îcogi _one"

Mbica îno îrîonania: îcogi

Kûthi mbere

"This picture shows: î-cogi"

Mwaria wa Kîîtharaka oonire:

îcogi _mwe

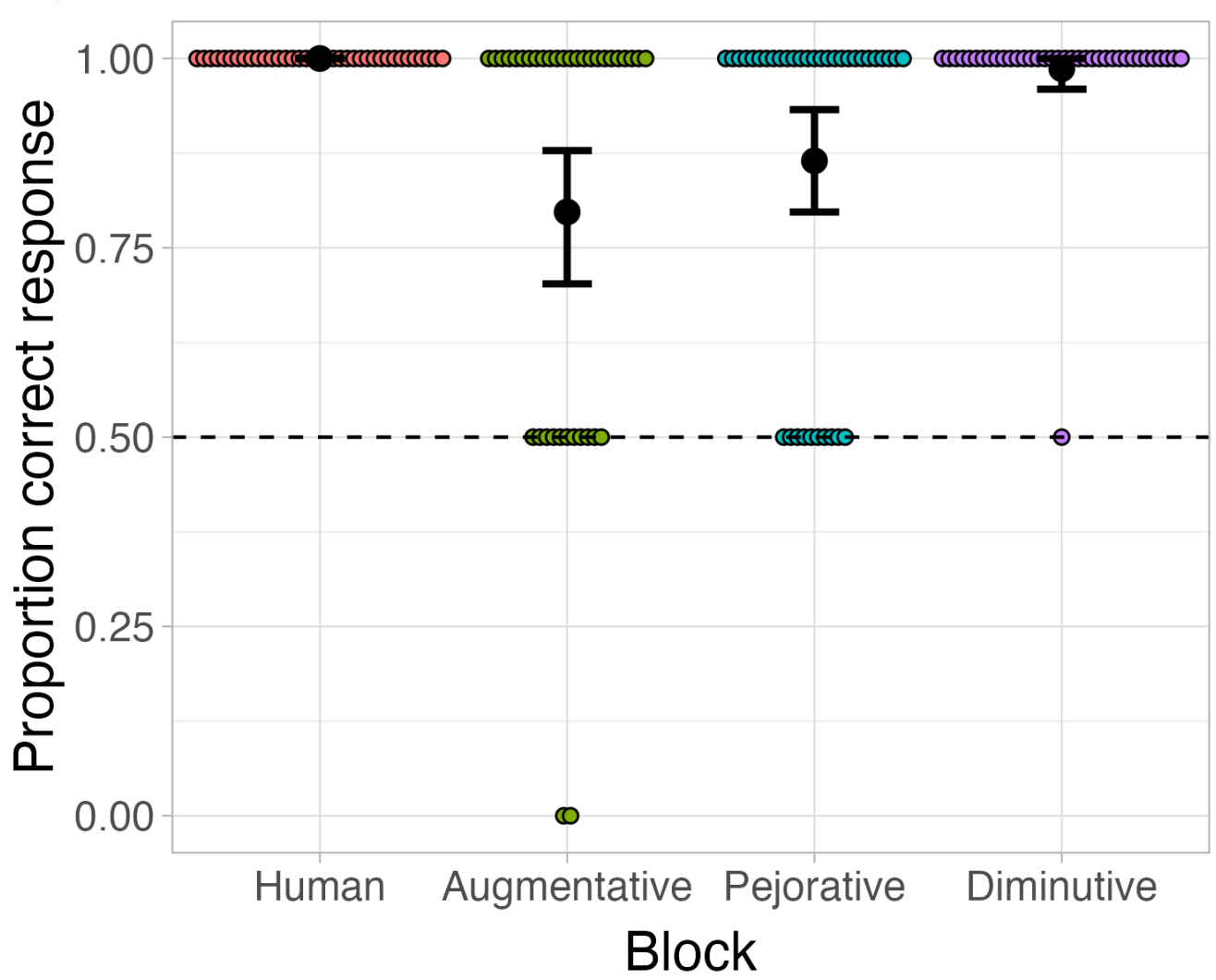
Kûthi mbere

(b) Pejorative

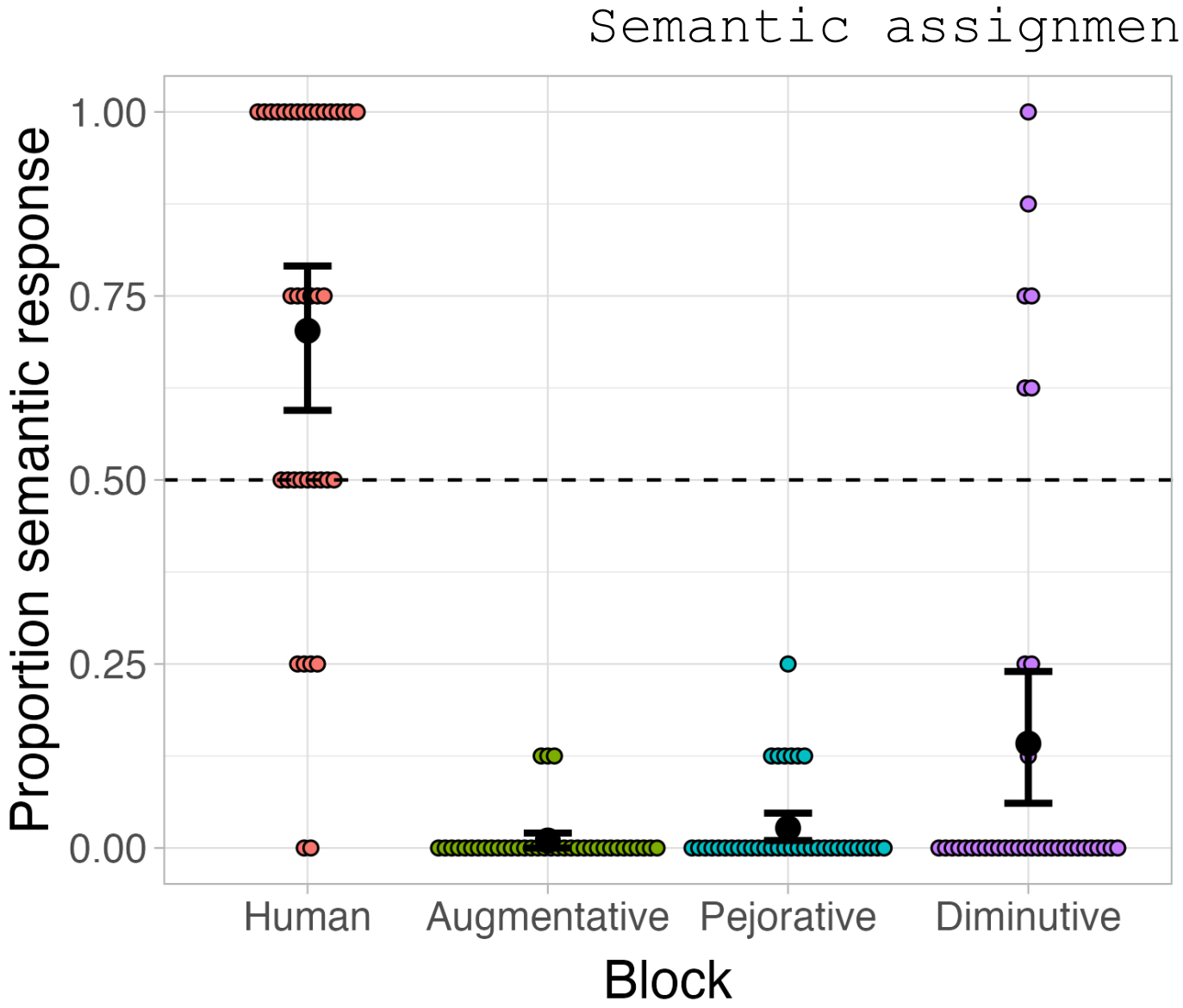
Results: Aligned trials

Correct responses in *Aligned trials*

by blo



Results: Conflicting trials



Statistical analyses (LME
Human block significantly
Different from other mean

Discussion

1. **Why is human feature more reliable that other semantic features?**
   - Statistical reliability?
   - Conceptual accessibility or perceptual salience?
2. **Why do adult speakers of Kîîtharaka differ from those in other studies in their overwhelming preference for morphophonology?**
   - Prominence and reliability of morphophonology as a cue type- nominal prefixes are ubiquitous and highly productive

Future work

- Run tests with **child participants** to establish whether this differential preference (and strong role of human-ness) is present at the age of acquisition or develops over time
- Reproduce the study with adult participants of other systems with highly reliable morphophonological cues e.g., Spanish

Thank you for listening!

Questions, and comments/suggestions are welcome!

References

Corbett, Greville G et al. 1991. Gender. Cambridge University Press.

Culbertson, Jennifer, Annie Gagliardi & Kenny Smith. 2017. Competition between phonological and semantic cues in noun class learning. Journal of Memory and Language 92. 343–358.

Culbertson, Jennifer, Hanna Jarvinen, Frances Haggarty & Kenny Smith. 2019. Children's sensitivity to phonological and semantic cues during noun class learning: Evidence for a phonological bias. Language 95(2). 268–293.

D´echaine, Rose-Marie, Rapha¨el Girard, Calisto Mudzingwa & Martina Wiltschko. 2014. The internal syntax of shona class prefixes. Language sciences 43. 18–46.

Del Tomba, Alessandro. 2023. The gender system of tocharian: A synchronic and typological overview. In The tocharian gender system, 9–65. Brill.

Demuth, Katherine. 2000. Bantu noun class systems: Loan word and acquisition evidence of semantic productivity. Systems of nominal classification 270–292.

Enger, Hans-Olav. 2009. The role of core and non-core semantic rules in gender assignment.Lingua 119(9). 1281–1299.

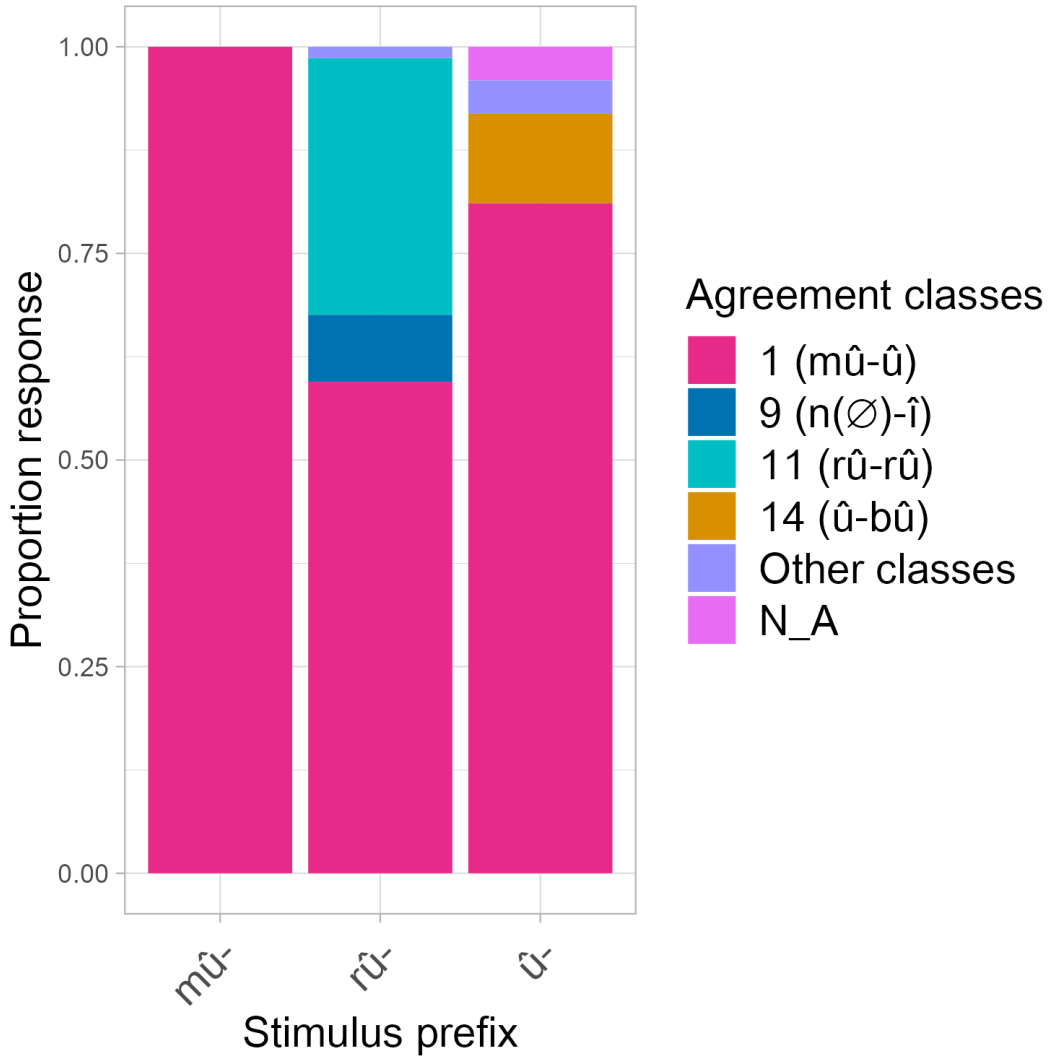
Frigo, Lenore & Janet L McDonald. 1998. Properties of phonological markers that affect the acquisition of gender-like subclasses.Journal of Memory and Language 39(2). 218–245.

Gagliardi, Annie, Naomi H Feldman & Jeffrey Lidz. 2017. Modeling statistical insensitivity:Sources of suboptimal behavior. Cognitive science 41(1). 188–217.

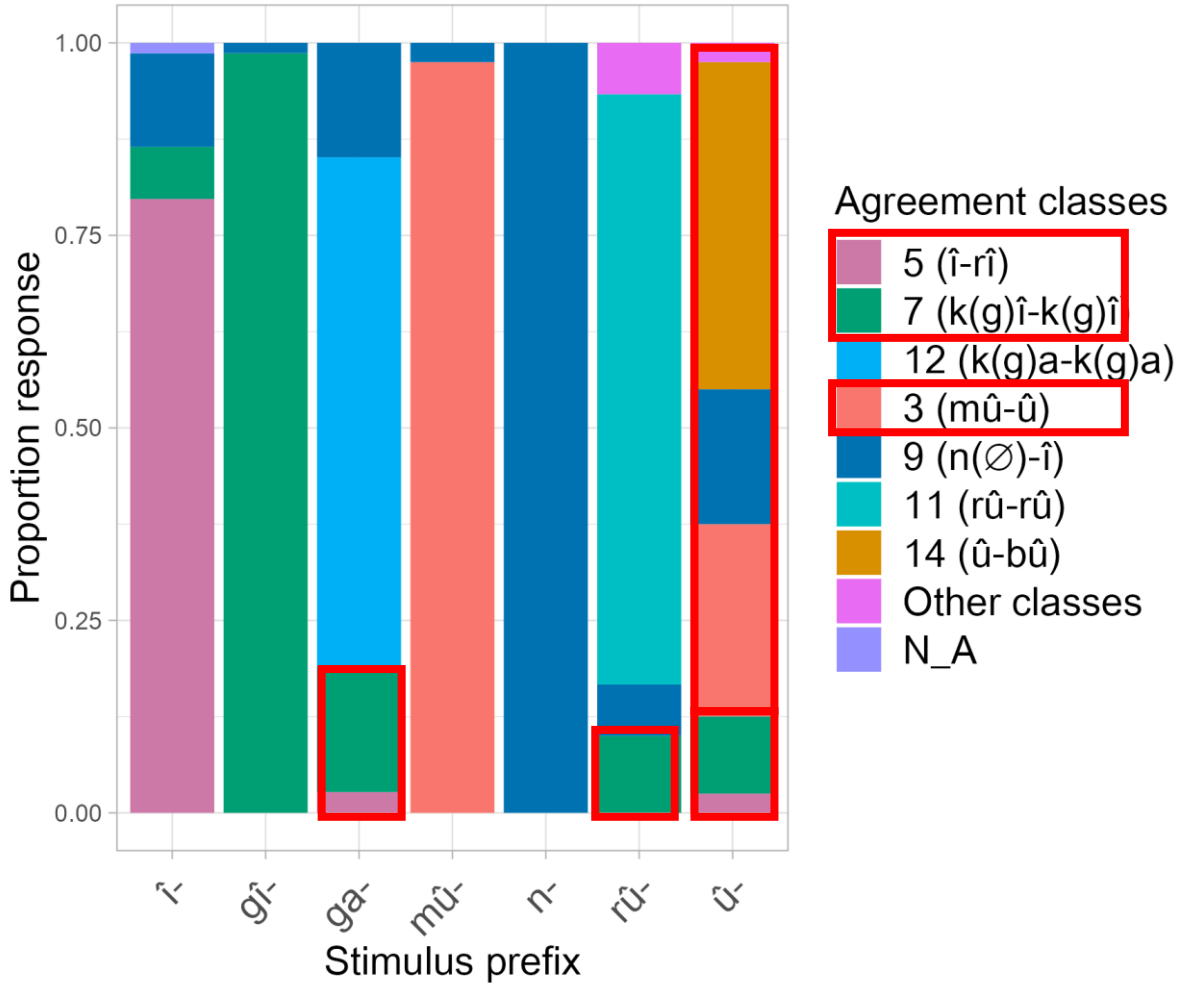
Kanampiu, Patrick, Alexander Martin & Jennifer Culbertson. Under review. Experimental evidence for semantic and morphophonological productivity in kˆıˆıtharaka noun classes .

Results

Human block

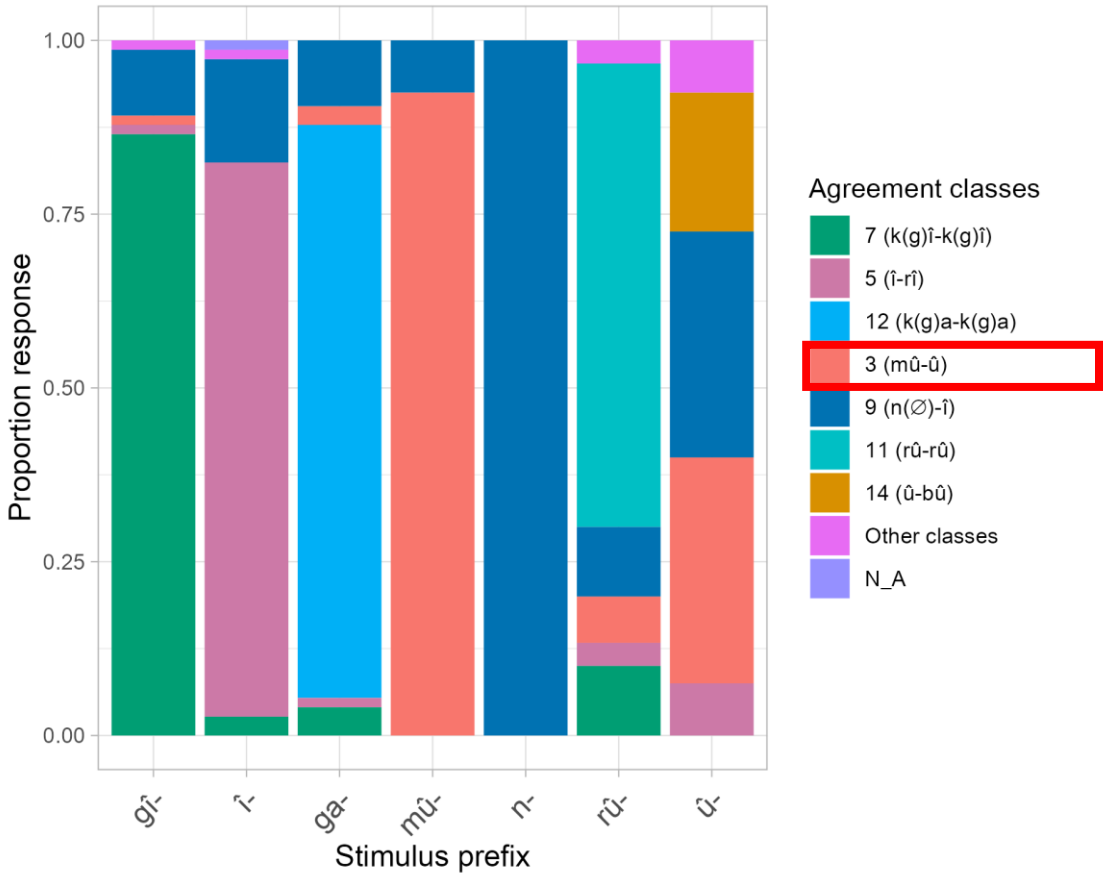


Augmentative block

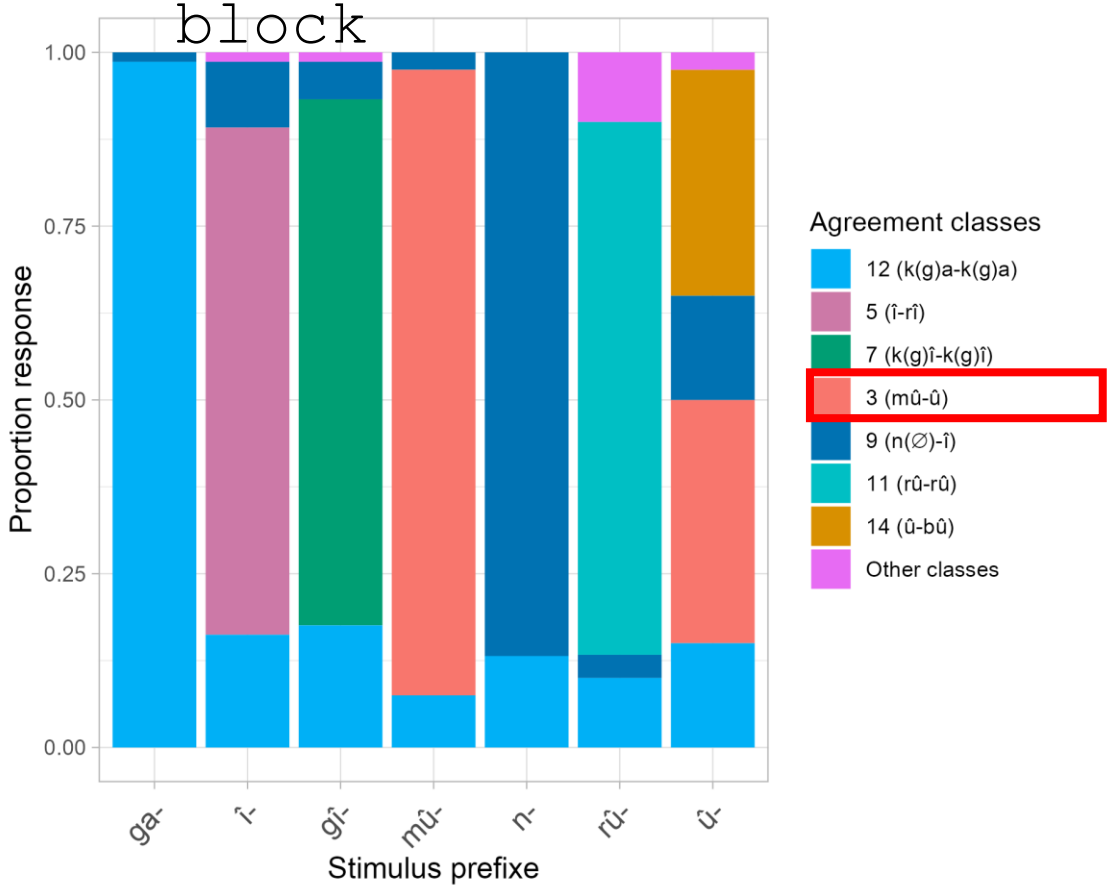


Results

Pejorative block



Diminutive block



Traditional approaches to Bantu noun classes

There are complexities...

- Semantic heterogeneity/shared meaning across classes

Noun Classes	Meaning
1/2	human, other mates
1a/2a	kinship animates, proper nouns
3/4	trees, plants, non-paired body parts, other
5/6	fruits, paired body parts, natural phen inanimates
6	Liquid masses
7/8	animates
9/10	animates/ inanimat
12/13	diminutives
14	Abstract nouns, mass nouns
15	infinitives
16, 17, 18	locatives (near, remote, inside)
19	diminutives
20/22	augmentatives (diminutives)
21	augmentative pejoratives

(Proto Bantu, Richardson, 1967; Welmers, 1973)

Semantic features coded for

Expected Class	Semantic Feature(s)
1	human
3	Extended shape, spread shape, protruding shape, trees & plants, dispersive mass
5	Fruits, round shape, plant part, augmentative, made of wood, cohesive mass
7	Artefacts, pejorative, derived
9	Animals, artefacts, loan (other)
11	Narrow things, wavy-shaped things
12	Diminutives
14	Abstract, mass
15	Derived, infinitives