



Acoustic transitions in Khmer word-initial clusters

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Introduction

PHONOLOGICAL status of interconsonantal acoustic transitions (Ξ) known to differ across languages [3, 7, 9, 10]

Khmer (Cambodian) has an inventory of **70+** CC onset clusters

C ₁	C ₂														
↓	p	t	tʃ	k	ʔ	b	d	m	n	ɲ	ŋ	l	r	s	h
p		pt	ptʃ	pk	pʔ		pd		pn	pɲ	pŋ	pl	pr	ps	ph
t	tp			tk	tʔ	tb		tm	tn		tɲ	tl	tr		th
tʃ	tʃp			tʃk	tʃʔ	tʃb	tʃd	tʃm	tʃn		tʃɲ	tʃl			tʃh
k	kp	kt	ktʃ		kʔ	kb	kd	km	kn	kɲ	kŋ	kl	kr	ks	kh
s	sp	st		sk	sʔ	sb	sd	sm	sn	sɲ	sŋ	sl	sr		
m		mt	mtʃ		mʔ		md		mn	mɲ		ml	mr	ms	mh
l	lp			lk	lʔ	lb		lm			lɲ				lh

Huffman [6]: clusters can be organised into **three classes** based on the type of acoustic transition that separates them

Class 1

no transition
/psaa/ > [psaa]

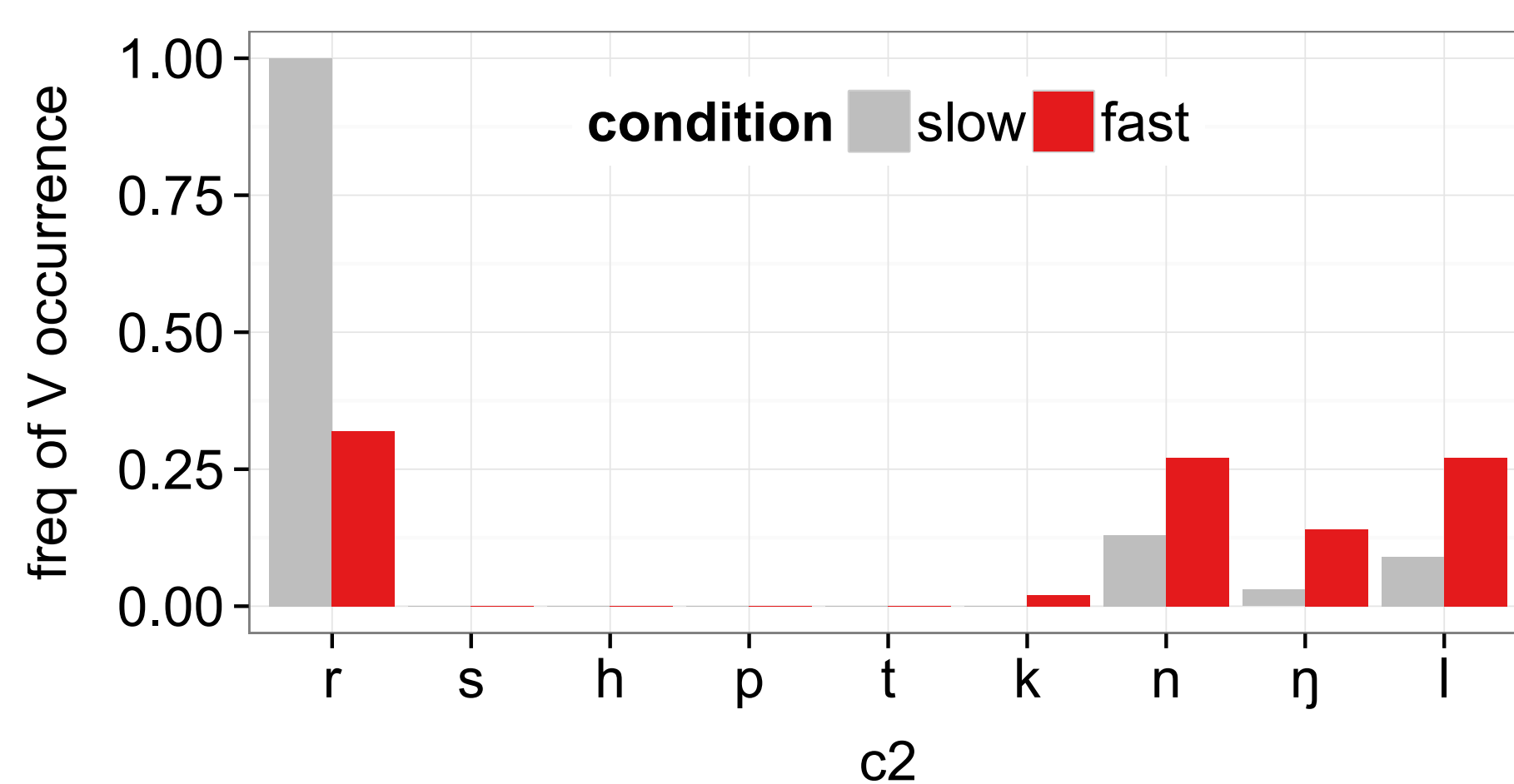
Class 2

voiceless transition
/pteah/ > [p^hteah]

Class 3

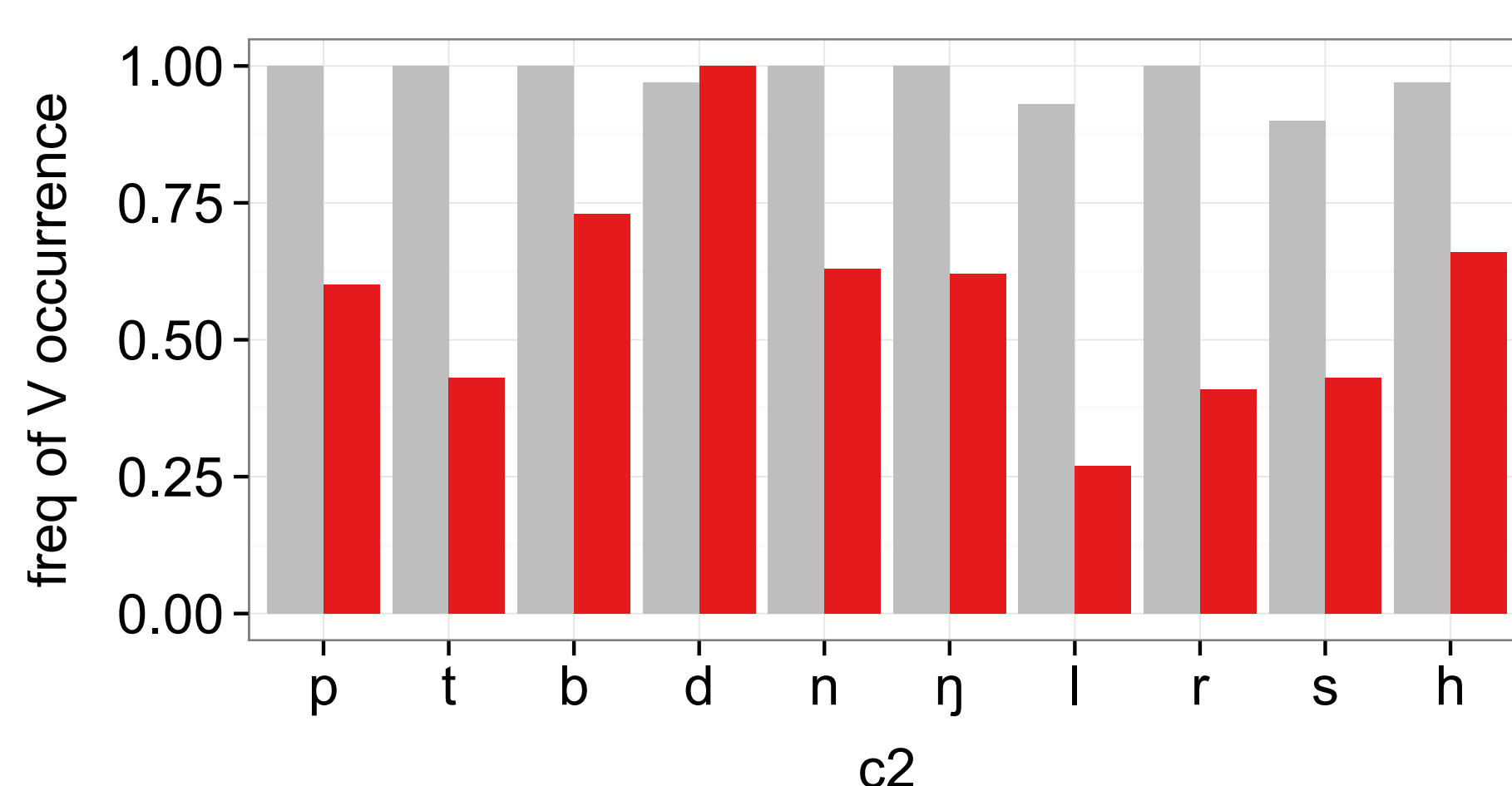
voiced transition
/pdəj/ > [p^ədəj]

Results: Frequency of transition



Class 1 /Cs Ch/: no intrusion; on /Cr/: [8]

Class 2: transitions are **more** frequent at faster speech rates!



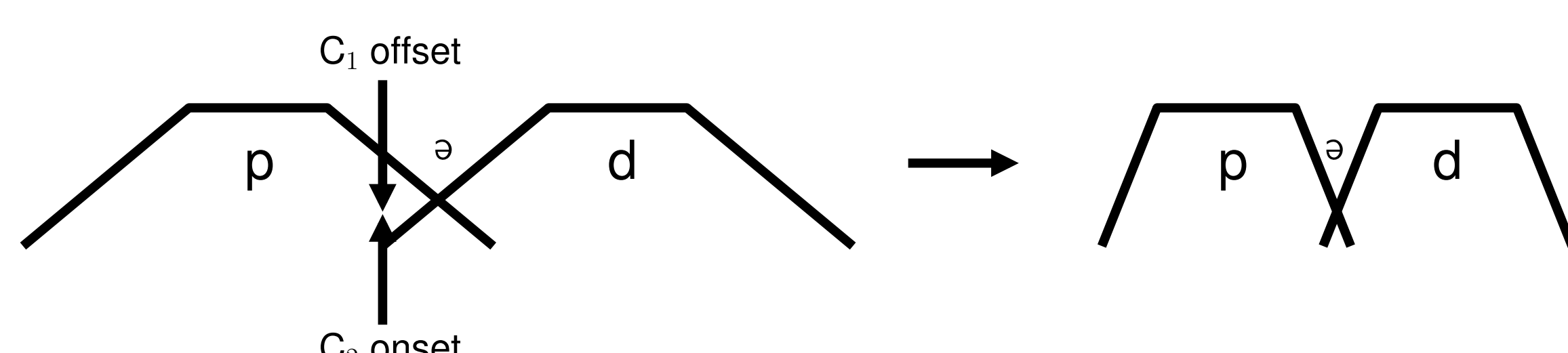
Class 3: transitions often less frequent in fast speech, but never disappear completely

Speech rate effects on vowel intrusion

- While increase in the relative overlap of extant articulatory gestures at fast speech rates may be a hallmark of intrusion [2, 5]...



- ... if relative timing is maintained but spatial displacement adjusted, two Cs may have an audible transition **regardless of the speed of articulation** [2, 4]



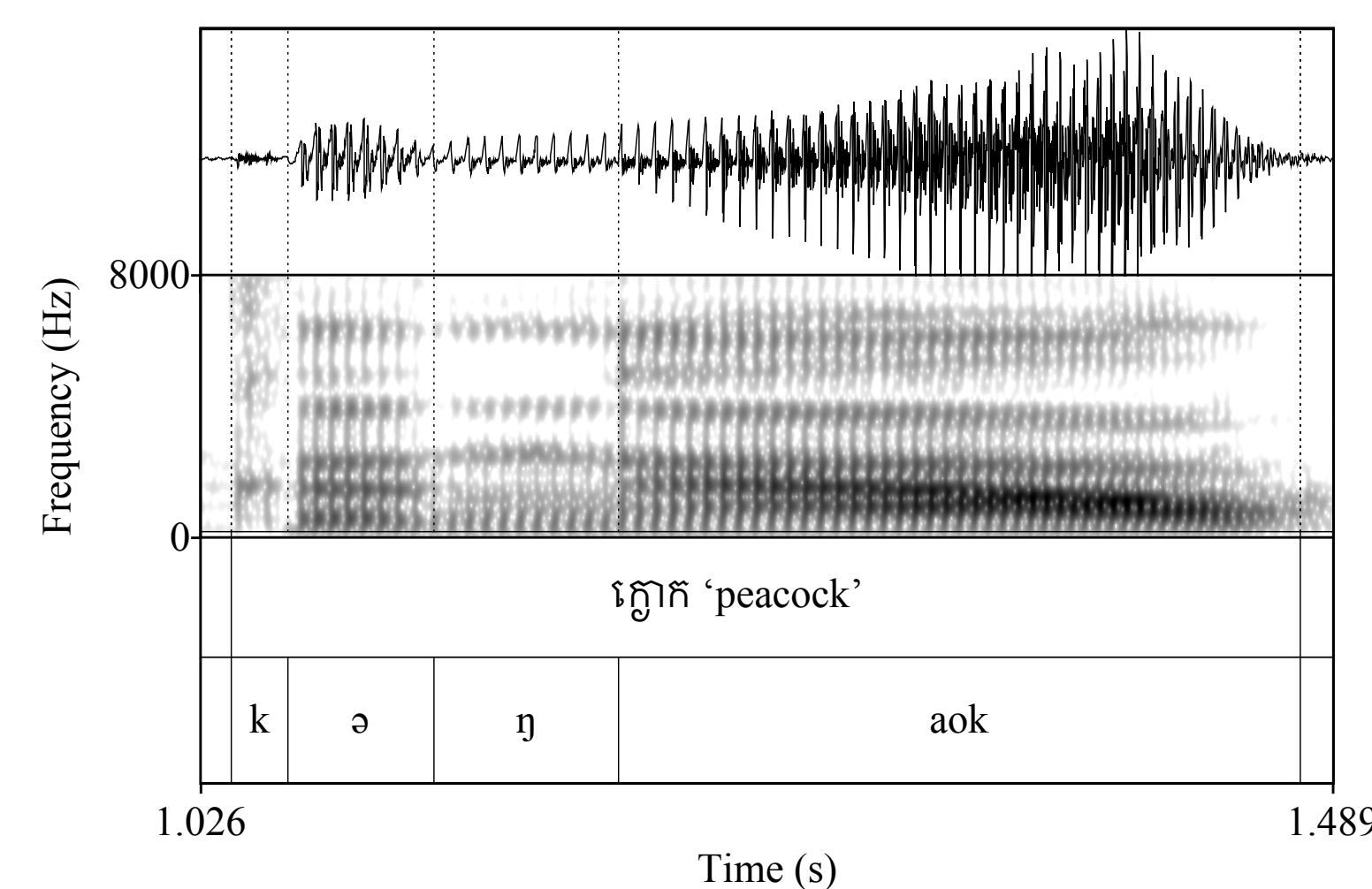
Although disappearance of Ξ in fast speech may be a good indicator of excrescence, converse is not necessarily true [4, 5]

What is the phonological status of Ξ in Khmer?

- One possibility: Ξ in Khmer result from **gestural underlap** [1]
- Primary evidence: duration of lexical CVC monosyllables > CXC clusters; Ξ has more variable formant structure than \check{V}
- Alternatively: whatever Ξ is, it's just **different** from \check{V} , but still has an associated phonological target
- One diagnostic of (phonetic) excrescence: disappearance of Ξ in fast speech [5]

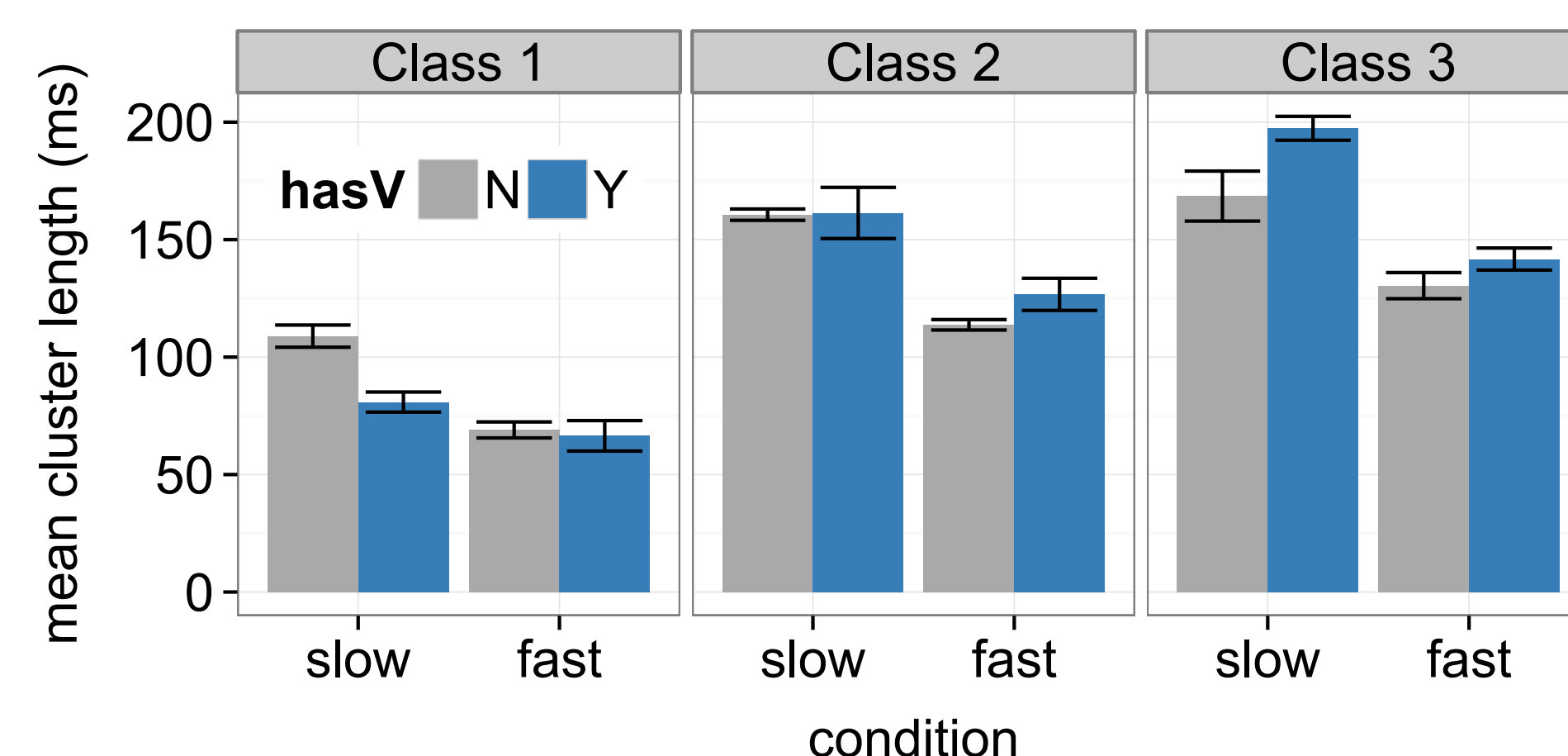
What happens to Ξ at different speech rates?

Methods



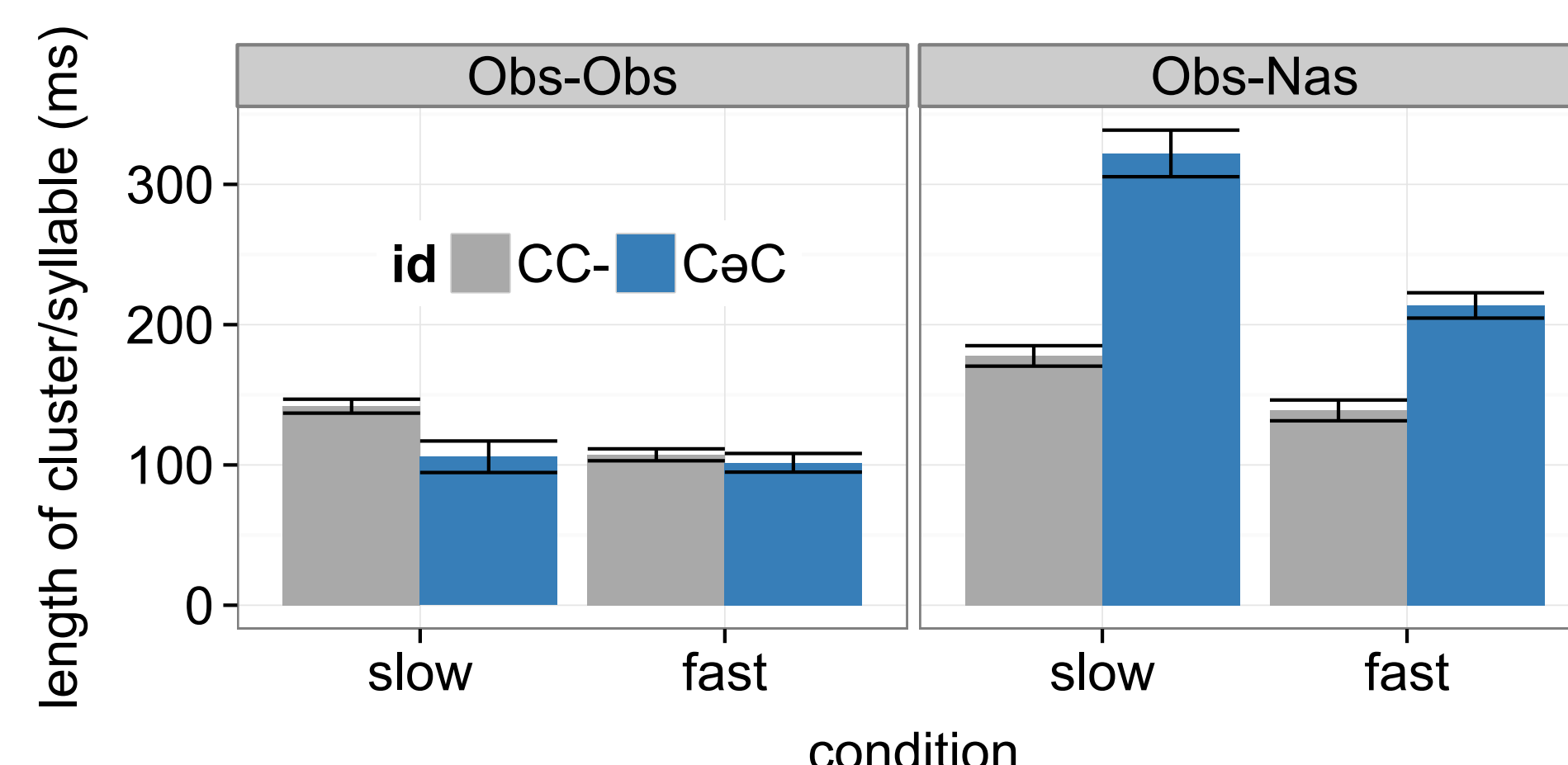
- 10 native speakers (3 female) recorded producing 79 items × 3 repetitions × 2 rates
- List included 61 C₁C₂V(C) items (35 cluster types) + 8 CəC monosyllables
- All items in carrier phrase /kɲom tha: __ tiət/ 'I say __ again'

Results: Cluster duration & lexical CəC



Slow: CXC >> CC ($\beta = 13.5$, $SE = 2.8$, $p < 0.001$)

Fast: weak trend ($\beta = 5.98$, $SE = 3.13$, $p = 0.06$)



Slow: CXC > CəC; CəN >> CXC

Fast: CXC ~ CəC; CəN >> CəC

Summary

- Both context and speech rate have variable effects on the appearance of acoustic transitions in Khmer
- Single voiced C can license Ξ , but likelihood varies with class; for some cluster types, Ξ more common in faster speech
- Current acoustic data cannot rule out a gestural target associated with acoustic transitions in this language

References

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