Convergence and divergence in Eastern Cham language contact

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Problem

- It has been said that the following change in Eastern Cham is a contact effect from Vietnamese
  - Eastern Cham: **măta* > *ta* 'eye'
  - Vietnamese: monosyllabic roots
- However, this syllable reduction results in new phonemes and consonant clusters
  - Contrastive sonorant length (e.g. *m* vs. *m:*)
  - Novel consonant clusters (e.g. *mt-*, *nt-*)
- How/when can a phenomenon result in **convergence** on one level (i.e. word structure), but **divergence** on another (i.e. phonotactics)?

Claims

- Eastern Cham ‘monosyllabization’ is not just one process
- The new phonemes and consonant clusters originate from **convergent** phonetic processes
  - Vietnamese “fast speech”
- These processes are phonologized in Eastern Cham, resulting in phonological **divergence**
  - Contrastive sonorant length
  - Novel consonant clusters

Outline

1. Previous literature
   - What is monosyllabization, and is it a contact effect?

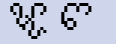
2. Descriptive account of Eastern Cham monosyllabization
   - Results of a sociolinguistic survey (n = 28)

3. Monosyllabization as language contact
   - Closer look at Vietnamese phonotactics

4. Nasalization as the phonologization of phonetic processes

1. Eastern Cham

- Eastern Cham (Austronesian: Vietnam) is spoken by about 120,000 people in south-central Vietnam
- Likely every speaker is bilingual with Vietnamese, the dominant sociopolitical language (Brunelle 2008)
- Eastern Cham is in a quasi-diglossic situation: (Brunelle 2005, 2009a; Brunelle & Phú forthcoming)
  - H (formal): largely preserves classical Cham script from several centuries ago → disyllabic roots
  - L (colloquial): casual speech, subsequent sound changes → monosyllabic roots

Proto-Chamic (Thurgood 1999)	Cham script (Akhăr Thrah)	H (formal)	L (colloquial)
**măta* 'eye'	 <ma-ta>	*măta*	*pta* ~ *mta* ~ *nta*~*ta*

1. What is monosyllabization?

- Eastern Cham is an SVO language with no bound morphology in the L (colloquial) variety
- Historically, many roots were sesquisyllabic:
  - Presyllable: minor, unstressed, reduced syllable

  - Main syllable: major, stressed, full length syllable
- 'Monosyllabization': Deletion or reduction of presyllables

1. Previous literature

- Some monosyllabization is evident in classical Cham script
  - Increasing contact with Vietnam in this period (e.g. Po 1994)
  - Presyllable deletion (a–b: Aymonier & Cabaton 1906)
  - Vowel elision, between stop + sonorant (c: Brunelle & Pittayaporn 2012: 417)

(3)

a.	<*ikan*> ~ <*kan*>	‘fish’
b.	<*hadaḥ*> ~ <*daḥ*>	‘gleam’
c.	<*palăj*> ~ <*plăj*>	‘village’

- This results in no new consonant clusters
  - Cf. **pluh* > *plŭh* ‘ten’

* <x> brackets indicate orthography of the respective linguist.

1. Previous literature

- A new kind of monosyllabization is seen in the 1960's (David Blood 1967: 24)
  - Nasalization to *m* (a–b)
  - Nasalization to homorganic nasal (c–d)

(4)	a.	<*lipəw*> ~ <***m***pəw>	'wash hair'
	b.	<*məta*> ~ <***m***ta>	'eye'
	c.	<*rituh*> ~ <***n***tuh>	'hundred'
	d.	<*likəy*> ~ <***ŋ***kəy>	'male'

* <x> brackets indicate orthography of the respective linguist.

1. Previous literature

- Alieva (1991: 223) reports variation between syllable deletion and vowel elision
  - Presyllable deletion (a–d)
  - Vowel elision, anywhere (a–d)

(5)

a.	<*kopaw*> ~ <***k***paw> ~ <*paw*>	‘water buffalo’
b.	<*lipow*> ~ <***l***pow> ~ <*pow*>	‘thousand’
c.	<*lomu?*> ~ <***l***mu?> ~ <*mu?*>	‘fat’
d.	<*poria?*> ~ <***p***ria?> ~ <*ria?*>	‘silver’

* <x> brackets indicate orthography of the respective linguist.

1. Previous literature

Summary

- There are at least three mechanisms of monosyllabization:
  1. Syllable deletion (Classical Cham script)
     - <*ikan*> ~ <*kan*> 'fish'
  2. Vowel elision (Alieva 1991)
     - <*palăj*> ~ <*plăj*> 'village'
  3. Nasalization (David Blood 1967)
     - <*lipəw*> ~ <*mpəw*> 'wash hair'
- All are attested in contemporary Eastern Cham (Bùi 1996: 34, 49; Brunelle & Phú forthcoming)

* <x> brackets indicate orthography of the respective linguist.

1. Is it a language contact effect?

- There are many contact effects from VN > Eastern Cham
  - Borrowings, functional words, phonotactics
- Monosyllabization is often considered to be one such contact effect, due to the monosyllabicity of Vietnamese (Alieva 1991, 1994; Thurgood 1996, 1999; contra Brunelle 2009a; Brunelle & Pittayaporn 2012; cf. discussion in Brunelle 2009a)

Vietnamese	Eastern Cham
phải [fǎj] 'must'	*ꞔaj* [pʰàj] 'must' (Brunelle 2008: 31)
là 'COP'	*ꞔa* [là] 'COP' (Brunelle & Phú forthcoming)
/ŋ/ → [ŋ͡m] / V_{rd}_	/ŋ/ → [ŋ͡m] / V_{rd}_ (Baclawski Jr. 2016)
Monosyllabic?	Monosyllabization?

1. Is it a language contact effect?

- But does monosyllabization stand up to scrutiny as a language contact effect?
  (Mougeon, et al 2005; Poplack & Levey 2010; a.o.)

1. Was the feature present in an earlier variety?
   - Deletion and vowel elision: Yes (cf. Cham script)
   - Nasalization: Unclear
2. Could the feature have evolved language-internally?
   - Deletion and vowel elision: Yes
     Brunelle & Pittayaporn (2012) argue for its typological naturalness
   - Nasalization: Unclear

1. Is it a language contact effect?

- But does monosyllabization stand up to scrutiny as a language contact effect?
  (Mougeon, et al 2005; Poplack & Levey 2010; a.o.)

3. Does degree of speaker contact correlate with use of the feature?
   - Deletion and vowel elision: No
     Brunelle (2005, 2009a) only finds correlation with quasi-diglossia
     But it could have arisen by contact, then attained social meaning
   - Nasalization: Not yet tested

4. Does degree of contact among varieties correlate with use of the feature?
   - Generally, yes:
     Châu Đốc Cham and Kompong Chhnang Cham have more disyllabic roots and are in contact with Khmer instead of Vietnamese (Brunelle 2009b)

1. Is it a language contact effect?

- But does monosyllabization stand up to scrutiny as a language contact effect?
  (Mougeon, et al 2005; Poplack & Levey 2010; a.o.)

5. Is the feature *identical* in both languages?
   - Most assume that Eastern Cham has replicated Vietnamese word structure
     - Proto-Chamic: Disyllabic > sesquisyllabic roots
     - Vietnamese: Monosyllabic roots
   - But it's not so simple as that. See, Section 3…

*Both Eastern Cham and Vietnamese have some trisyllabic roots (~1% of each lexicon). Feel free to ask me how these roots fit in here.

1. Summary

- There is evidence to doubt that deletion/elision are due to contact with Vietnamese
  - It could still be a contact effect, but it would be difficult to prove so
- The status of nasalization is much less clear
  - Classical Cham script may not have marked syllabic nasals
  - Other studies have not focused on nasalization

	Expected for contact effect	Deletion/elision	Nasalization
1. Earlier variety?	No	**Yes**	?
2. Natural change?	No	**Yes**	?
3. Speaker contact?	Yes	**No**	?
4. Variety contact?	Yes	Yes	?
5. Identical feature?	Yes	?	?

2. Sociolinguistic survey

- "Without a full sociolinguistic survey, it is difficult to lay out precise rules [of monosyllabization]"
  (Brunelle & Phú forthcoming)
- We made first steps towards such a survey:
  - Core sample of 28 speakers, aged 18-37 (median: 22)
  - 16 identified as female, 12 as male
  - From the Cham villages of Ninh Thuận province
  - Interviewed in Ho Chi Minh City and the Cham villages (2015-6)
- Survey structure
  - Instructed to speak colloquially
  - Word list, followed by Sentence task with 50 words
    28 historically disyllabic roots

2. Sociolinguistic survey

- Forms were coded impressionistically (by author)
  - Disyllabic vs. monosyllabic
  - Identity of reduced presyllables
  - Due to recording conditions (loud cafes), acoustic measurements were infeasible

- Total: 1,252 tokens
  - 52 disyllabic (spread among 6 female, 7 male speakers)
  - 1,200 (96%) monosyllabic forms

2. Results: Mono- vs. disyllables

- Logistic mixed effects models with likelihood ratio tests (R environment, `lme4`, `pwr` packages)
- Fixed effects:
  - Age (18-37)
  - Gender (16 female, 12 male)
  - Village (10 from Palei Hamu Craok, 7 from Hamu Tanran, 6 from Palei Ram)*
  - Task (Word list, Sentence)
- Random effects:
  - Individual speaker
  - Location of interview (Ho Chi Minh City, Cham villages)
  - Lexical item
  - Order in interview

*Làng Bầu Trúc, làng Hữu Đức, làng Văn Lâm, respectively

2. Results: Mono- vs. disyllables

- Age, Gender, Task n.s.
- Village significant, such that Palei Hamu Craok uses fewer disyllabic roots
  (Observer effect: participants recruited by assistant from Hamu Craok)

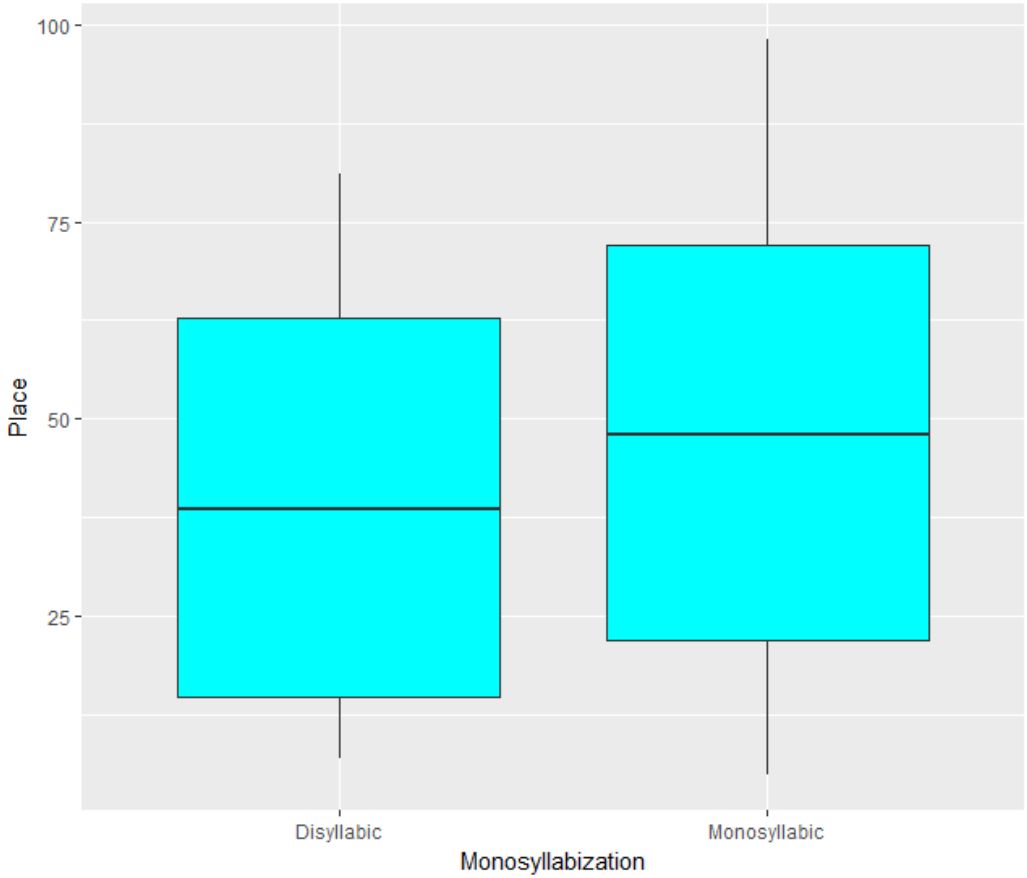
Fixed effects	Estimate	Std. Error	z value	Pr(>|z|)
Gender:M	0.008649	0.915453	0.009	0.992
Task:Sentence	0.4896	0.3522	1.39	0.164
Village:HAMU CRAOK	2.8966	1.4373	2.015	0.04387 *
Village:HAMU TANRAN	-0.2374	1.196	-0.198	0.84266
Village:RAM	0.1833	1.1143	0.164	0.86937

2. Results: Mono- vs. disyllables

- Order of interview weakly significant, such that disyllabic roots were uttered earlier in the interview (Formality effect)
- Welch Two Sample t-test (unequal sample sizes): $t(53) = 1.9, p = 0.06$

Inference:

- Monosyllabization is bound up with formality
- In line with its status as a shibboleth of diglossia (Brunelle 2005, 2009a; Baclawski Jr. 2016)



2. Results: Presyllable reduction

- Of the 28 disyllabic roots:
  - 13 involve syllable deletion (6)
  - 4 involve vowel elision (7)

(6)

a. **ăsaw > thaw* ‘dog’
b. **ăpar > pan* ‘to fly’
c. **pḁ̆pɛ > p̥ɛ* ‘goat’*
d. **ăsɛh > thɛh* ‘horse’
e. **p̥ĭʔar > ʔ̥an* ‘paper’
f. **ăjun > jun* ‘to rock’
g. **tăpaj > paj* ‘rabbit’
h. **pḁ̆puŋ > p̥uŋ* ‘top of’
i. **paplɛj > p̥lɛj* ‘sell’
j. **ăŋĭn > ŋĭn* ‘wind’
k. **ăkhăn > khăn* ‘word’
l. **pḁ̆proj > p̥roj* ‘yesterday’

(7)

a. **hăla > hla* ‘leaf’
b. **hărɛj > hrɛj* ‘day’
c. **pălɛj > plɛj ~ mlɛj* ‘village’**
d. **mɨ̆ʔĭn > mʔĭn ~ ʔĭn* 'play'

*Open circles underneath consonants mark breathy register on the following vowel.
**Feel free to ask me about the *p*~*m* alternation.

2. Results: Presyllable reduction

- Of the 28 disyllabic roots:
  - 6 involve deletion and compensatory lengthening
  - The following consonant must be a sonorant

(8) a. **lĭmɨn* > *mːɨn* 'elephant'

b. **tăŋĭn* > *ŋːĭn* 'fist'

c. **t̥ăraʔ* > *r̥ːaʔ* 'market'

d. **c̥ămɔʔ* > *m̥ːɔʔ* 'mosquito'

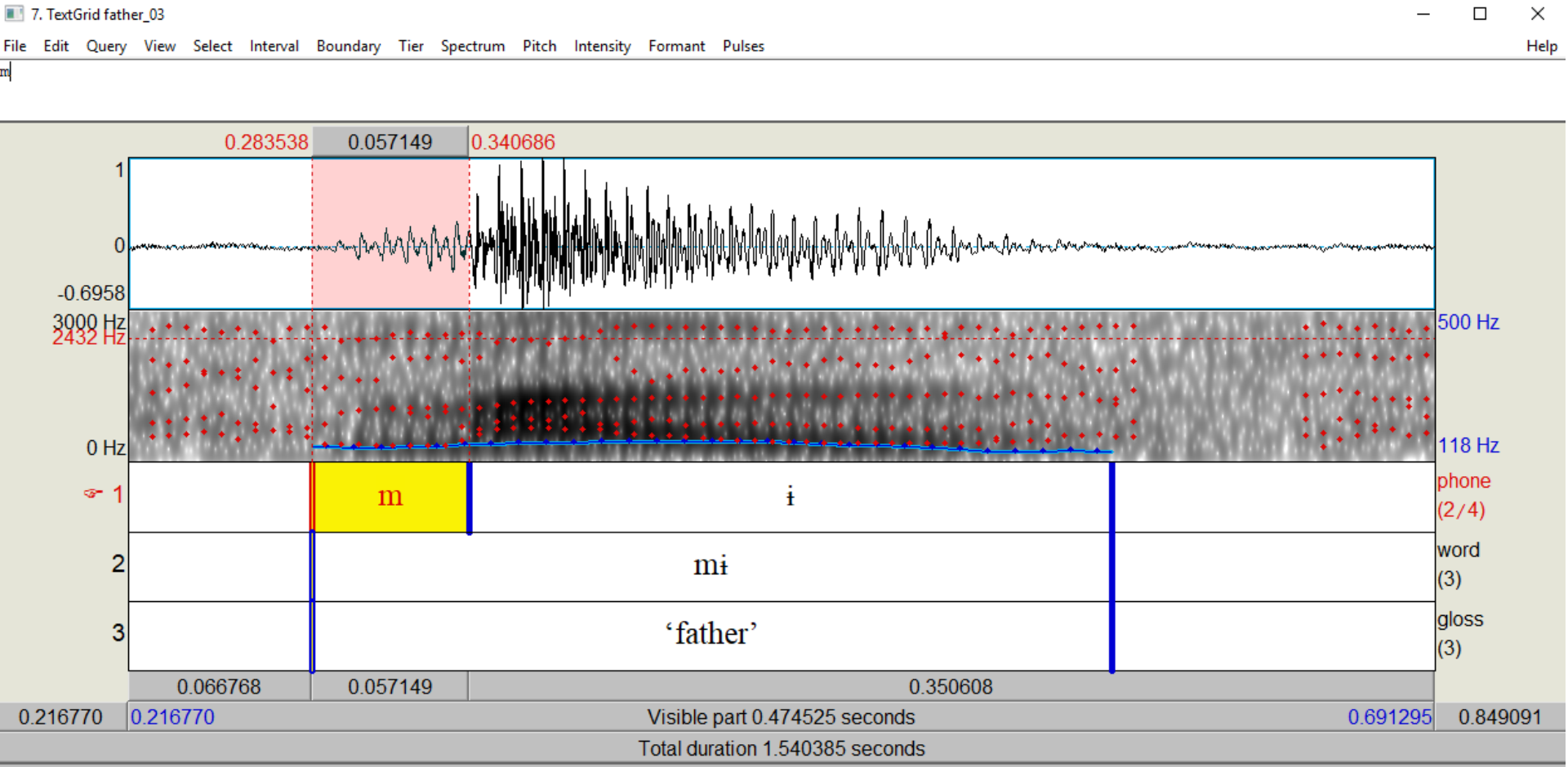
e. **mănujs* > *nːujh* 'person'
or: *mnujh* (vowel elision)

f. **sănɨŋ* > *nːɨŋ* 'think'
or: *hnɨŋ* (vowel elision + **s* > *th* > *h*)

*Feel free to ask why I think sonorant length is contrastive.

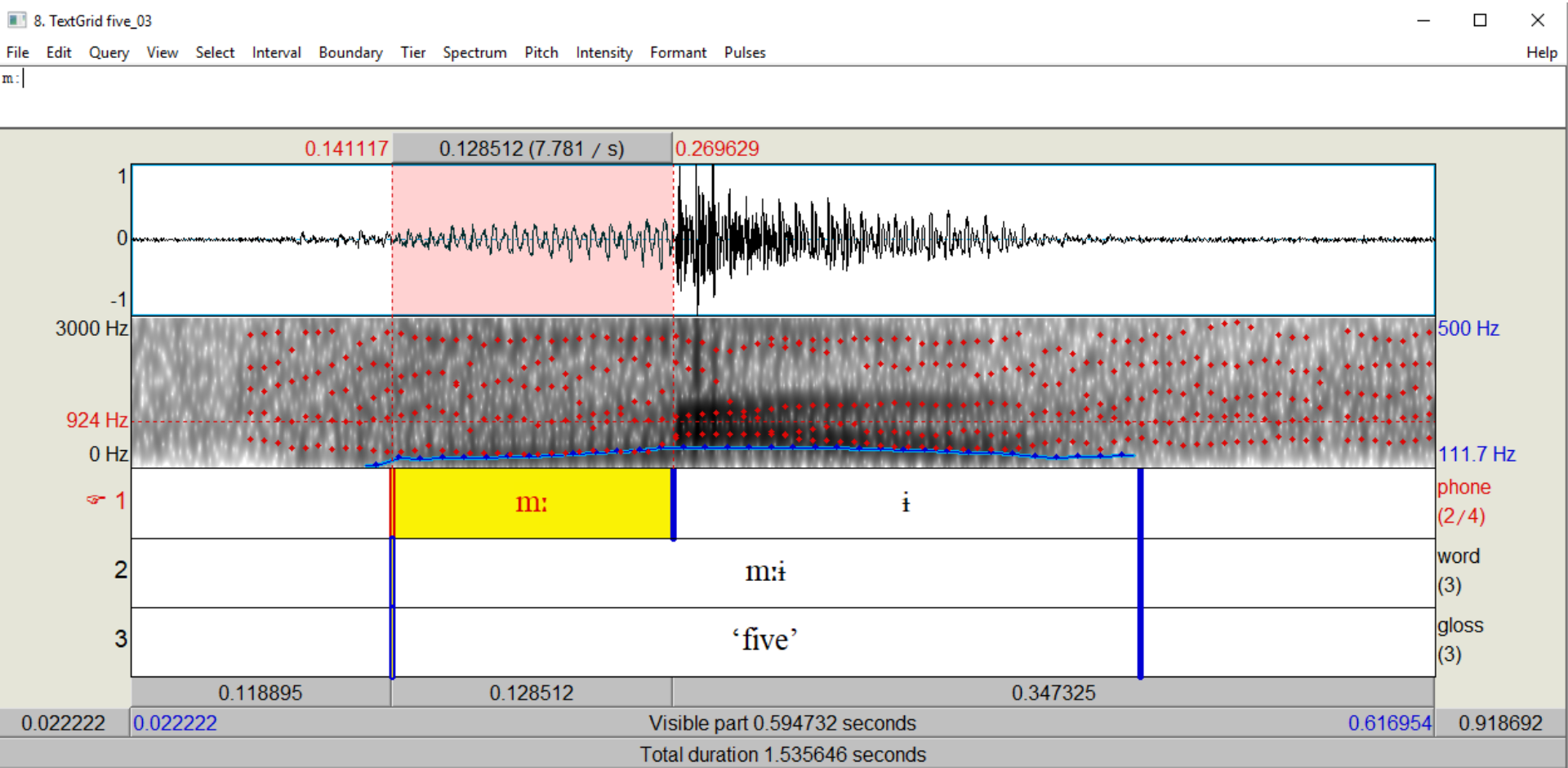
2. Results: Presyllable reduction

- **mɨ* > *mɨ* ‘father’ [57ms] (**ămɨ* in Proto-Chamic)



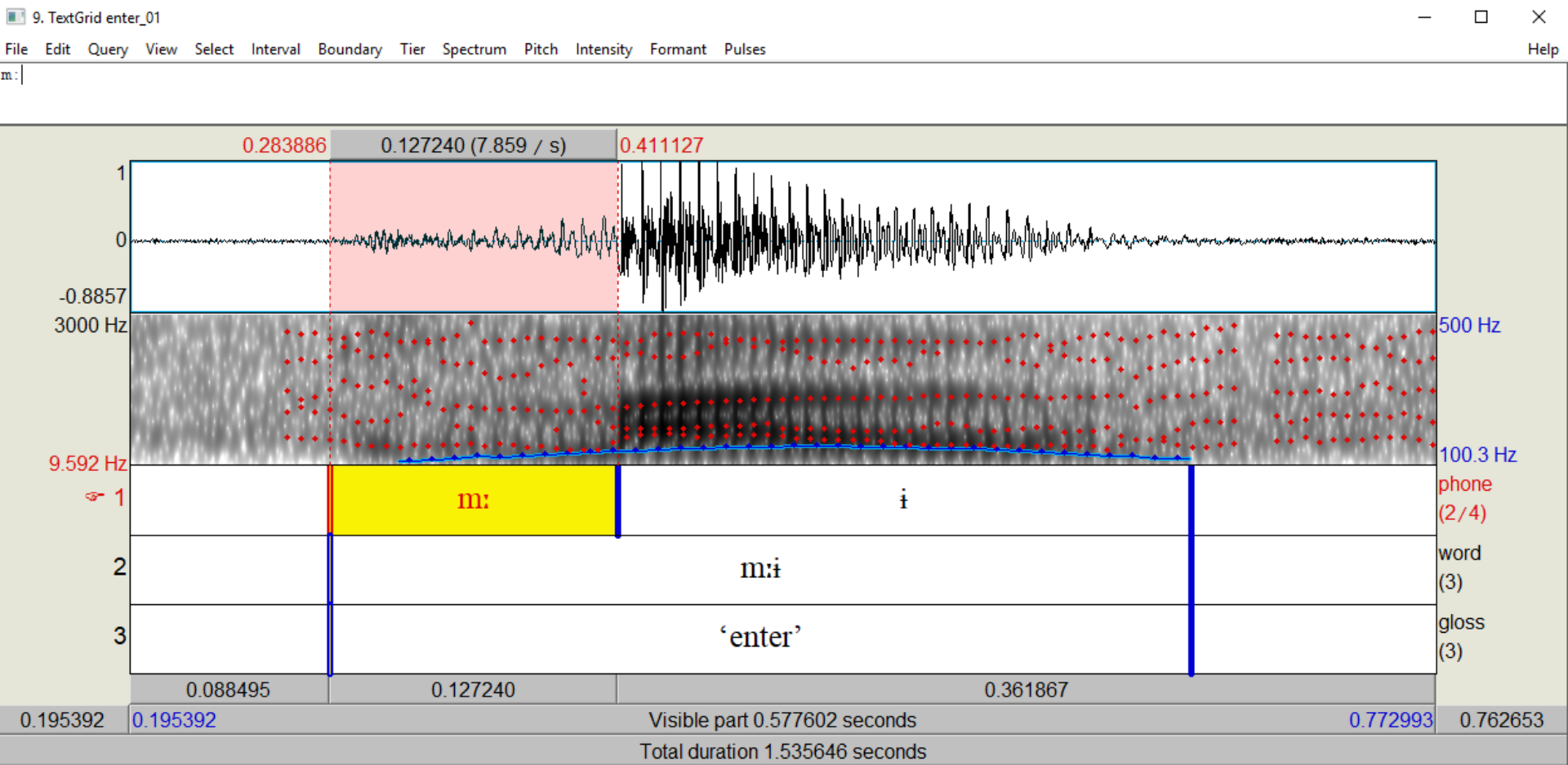
2. Results: Presyllable reduction

- **lĭmɨ* > *mːɨ* ‘five’ [128ms]



2. Results: Presyllable reduction

- **tămɨ* > *mːɨ* ‘enter’ [127ms]



2. Results: Presyllable reduction

- Of the 28 disyllabic roots:
  - 4 involve nasalization
  - The following consonant must be an obstruent
    - Impressionistically, similar phenomenon before *k* and *p*
  - Deletion and vowel elision with *p* are also possible

(9) a. **răsa* > *mtha* ~ *ntha* 'Sambhur deer'
or: *ptha* (vowel elision), *tha* (deletion)

b. **măta* > *mta* ~ *nta* 'eye'
or: *pta* (vowel elision), *ta* (deletion)

c. **lĭsɛj* > *mthɛj* ~ *nthɛj* 'cooked rice'
or: *pthɛj* (vowel elision), *thɛj* (deletion)

d. **mĭt̥ih* > *mt̥ih* ~ *nt̥ih* 'wake up'
or: *pt̥ih* (vowel elision), *t̥ih* (deletion)

2. Results: Nasalization

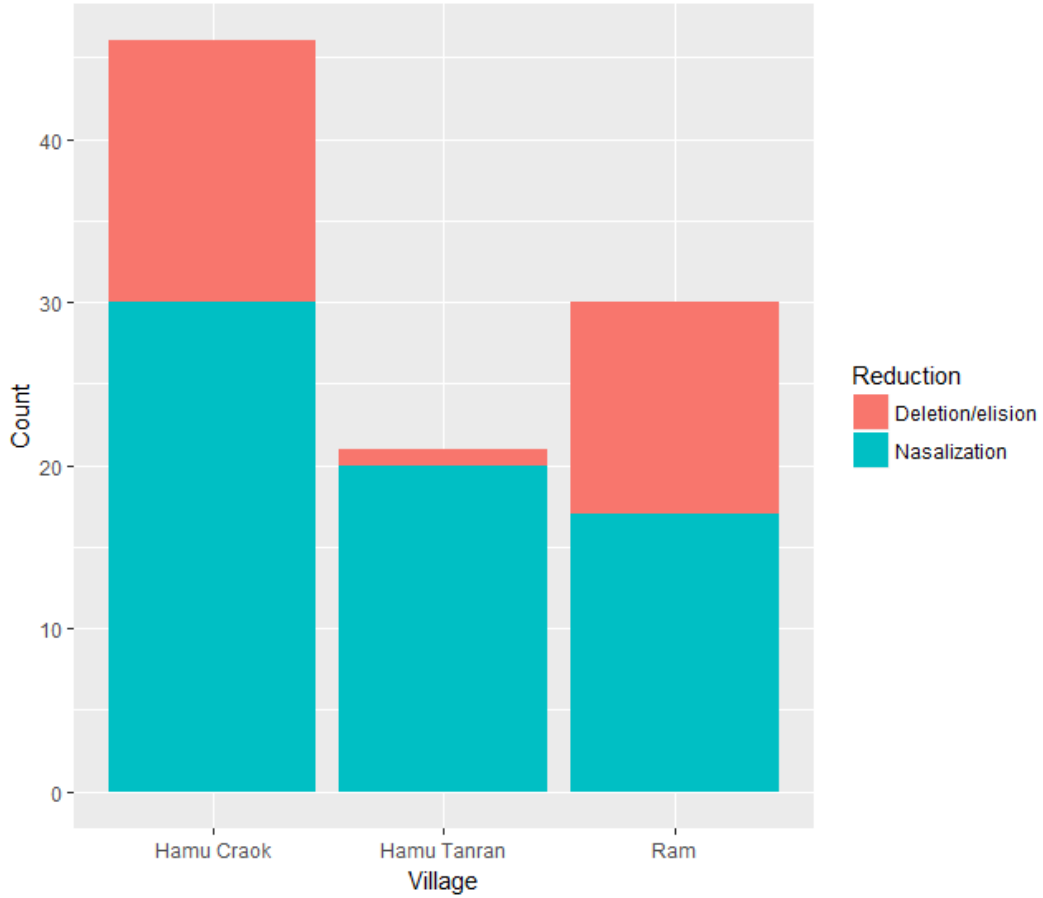
- There is wide variation between *m-, n-, p-*, and ∅-
- 25 of 28 speakers used at least two forms during the interview

Analysis:

- Logistic mixed effects model, likelihood ratio tests
- Reduced to two categories:
  - Nasalization: *m-*, *n-*
  - Deletion/ellipsis: *p-*, ∅-
- Age, Gender, Task, Order in interview n.s.
  - However, according to a 2 sample, unequal size power test: Only expect significance for large effect sizes ($h = 0.8$; Cohen 1992)

2. Results: Nasalization

- Village significant, such that Palei Hamu Tanran predicts nasalization, Palei Ram predicts deletion/ellipsis ($\beta = 9.27, p < 0.01$)

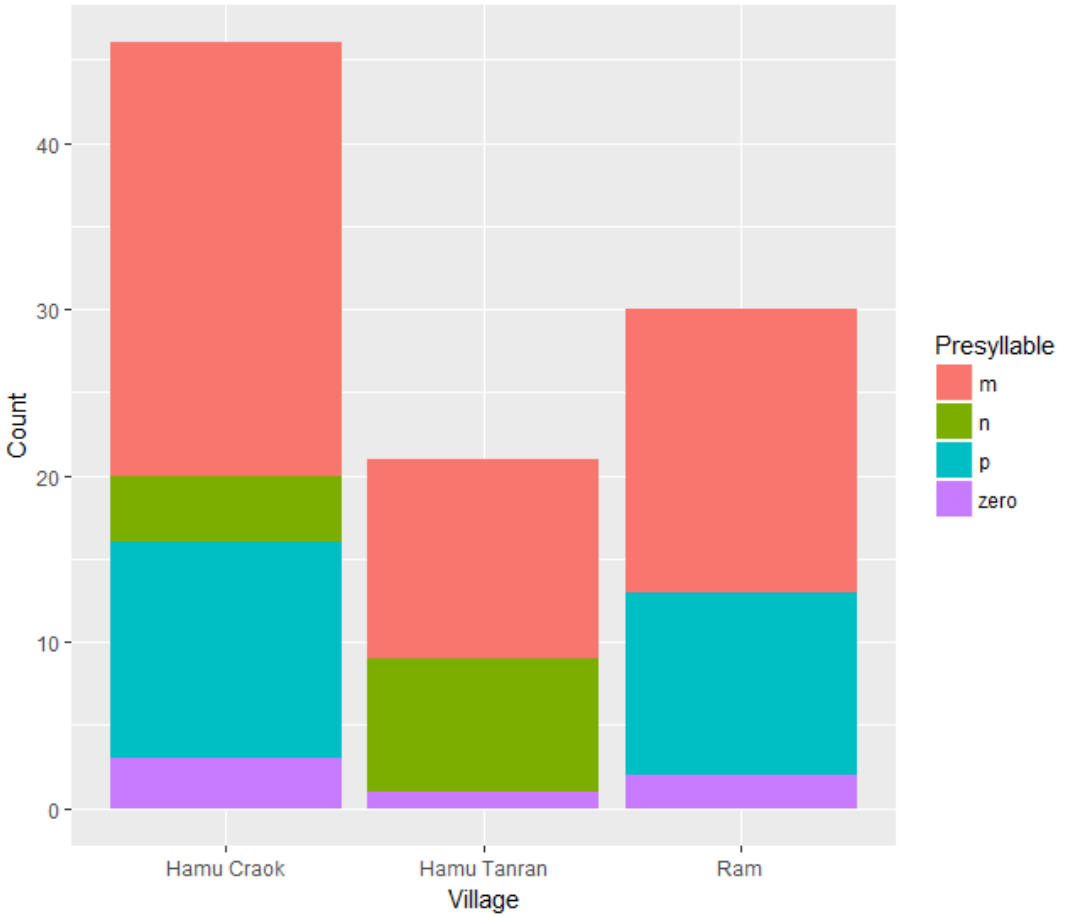


2. Results: Nasalization

- Village significant, such that Palei Hamu Tanran predicts nasalization, Palei Ram predicts deletion/ellipsis ($\beta = 9.27, p < 0.01$)
- Palei Hamu Tanran lacks *p-* form
- Palei Ram lacks *n-*

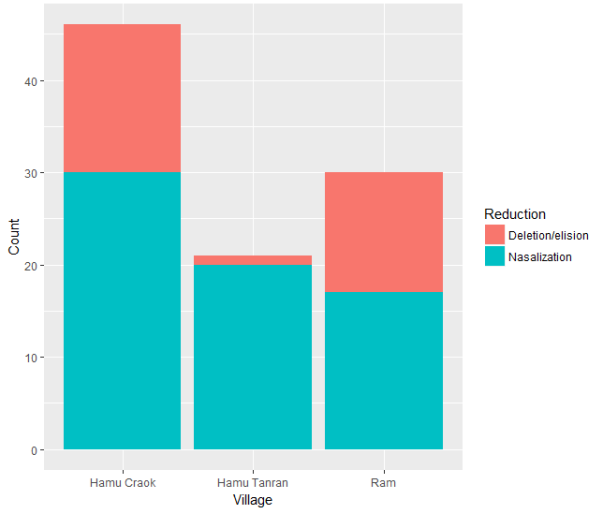
Inference:

- Presyllable reduction is not bound up with formality, instead subject to micro-regional variation

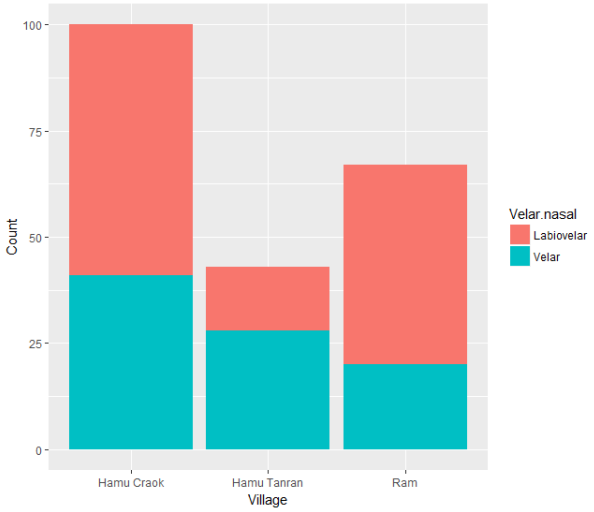


2. Results: Nasalization

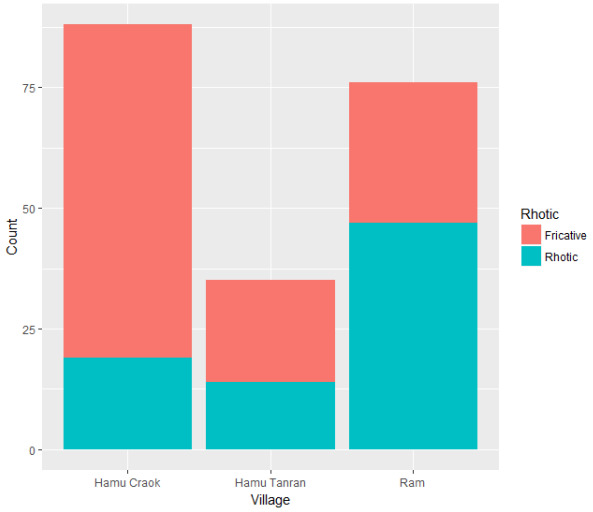
- Village robustly predicts a variety of other phenomena, but in inconsistent ways (Baclawski Jr. 2016)
- Future research is needed to understand why



Nasalization
(novel form in blue)



Labiovelar nasal
(contact form in red)



Pronunciation of /r/
(novel form in red)

2. Results: Summary

- Eastern Cham monosyllabization involves at least four processes:

1. Syllable deletion (lexically specified)
2. Vowel elision (lexically specified)
3. Deletion + lengthening (before sonorants)
4. Nasalization (before obstruents)
   - Alternates with vowel elision and deletion
   - Apparent micro-regional variation

3. Back to language contact…

1. Is the feature *identical* in both languages?
   - This is looking less likely…

A. Eastern Cham:
   - Deletion/elision → monosyllabic roots
   - **Deletion + lengthening → geminate sonorants**
   - **Nasalization → nasal + stop consonant clusters**

B. Vietnamese:

3. A closer look at Vietnamese

- Vietnamese does not only have monosyllabic roots
- ~50% of the lexicon is composed of opaque and transparent disyllabic compounds (Trần & Vallée 2009, 2017)

(10)	*bán*	*kết*		*bán.kết*
	sell	conclude	→	semifinal
	'semifinal'			'semifinal'

- Word-medial consonants (i.e. -*n*-) have different properties than word-final (i.e. -*t*) (Trần & Vallée 2009, 2017)
  - Longer duration of internal nasals, most stops
  - Greater bursts of some internal stops
  - Greater amplitude of some internal stops

3. A closer look at Vietnamese

- Vietnamese does in fact exhibit geminate sonorants and clusters in fast speech
- Words can reduce to syllabic sonorant clitics in fast speech (Pham 2008)
  - Occurs if the word is unstressed
  - The reduced form retains its tone
  - Deletion + lengthening when adjacent to a sonorant

(11)

đ̀ng	*có*	*làm…*		(fast speech)	
diŋ^{2}	kɔ^{3}	laːm^{2}	→	**diŋ^{2} = ŋ^{3}**	laːm^{2}
not	have	do		**not = have**	do

‘Do not do [it]…’ (Pham 2008: (2c))

3. A closer look at Vietnamese

- Vietnamese does in fact exhibit geminate sonorants and clusters in fast speech
- Words can reduce to syllabic sonorant clitics in fast speech (Pham 2008)
  - Occurs if the word is unstressed
  - The reduced form retains its tone
  - Deletion + lengthening when adjacent to a sonorant
  - Reduced to homorganic nasal when adjacent to obstruent

(12)

biết	*bao*	*nhiêu*		(fast speech)	
biɤt^{7}	baːw^{1}	ɲiɤw^{1}	→	**biɤt^{7} = n̩^{1}**	ɲiɤw^{1}
know	how	much		**know = how**	much

'know how much…' (Pham 2008: (1))

3. A closer look at Vietnamese

- Vietnamese does in fact exhibit geminate sonorants and clusters in fast speech
- Words can reduce to syllabic sonorant clitics in fast speech (Pham 2008)
  - Does occur if the unstressed word is phrase-initial
  - Furthermore, there is variation between *m-* and *n-*

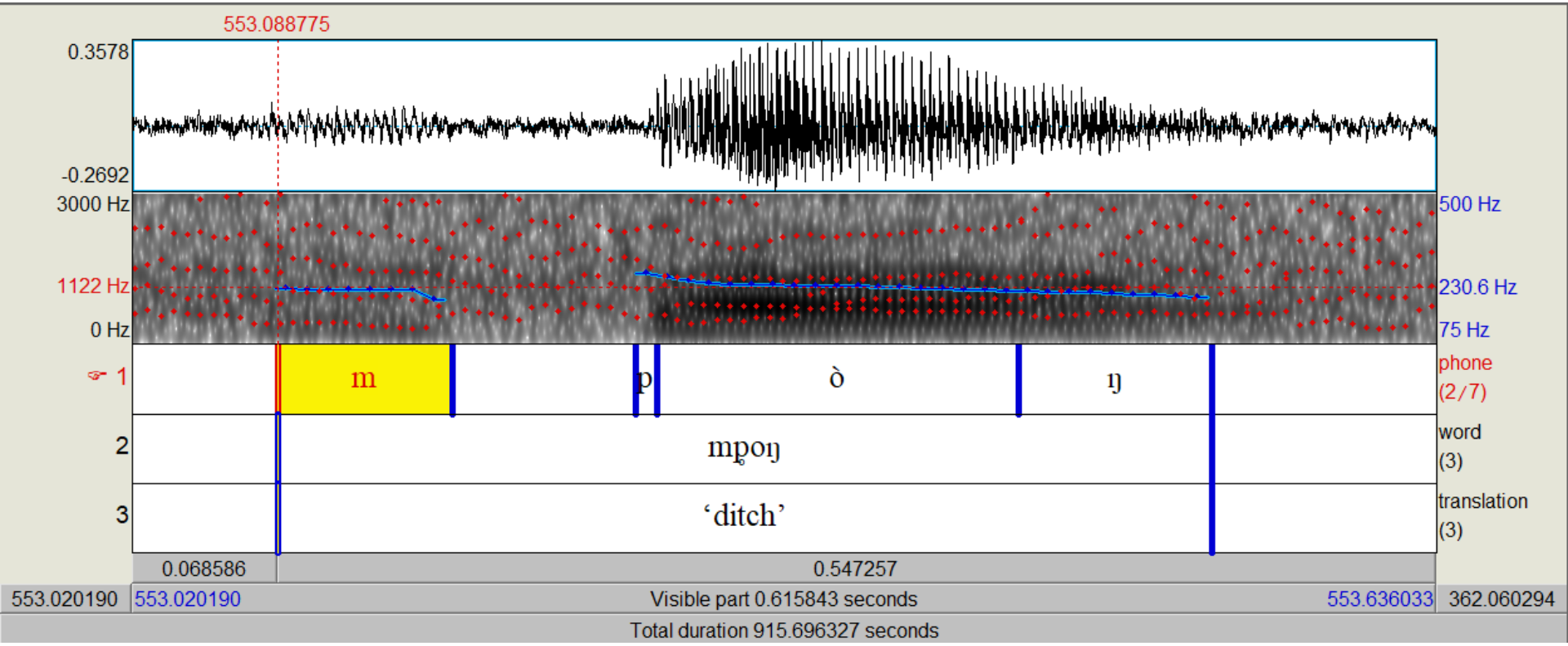
(13)

bài vở	*làm sao*		(fast speech)		
ba:j^{2} vɤ^{5}	la:m^{2} sa:w^{1}	→	ba:j^{2} vɤ^{5}	**m̩^{2} = sa:w^{1}**	~	**n̩^{2} = sa:w^{1}**
study	how			**how**		**how**

'How is (your) school going?' (Pham 2008: (13c))

3. A closer look at Eastern Cham

- Like Vietnamese fast speech reduction, Eastern Cham nasalized presyllables retain their register
  - **rĭp̥ɔŋ* > *mp̥ɔŋ* = modal nasal + breathy, falling vowel



3. Back to language contact…

1. Is the feature *identical* in both languages?
   - Deletion/elision: No
   - Lengthening/Nasalization: Yes

A. Eastern Cham:
   - Deletion/elision → monosyllabic roots
   - **Deletion next to sonorants → geminate sonorants**
   - **Deletion next to stops → nasal + stop clusters**

B. Vietnamese:
   - Monosyllabic or disyllabic roots
   - **Fast speech next to sonorants → geminate sonorants**
   - **Fast speech next to stops → nasal + stop clusters**

4. Convergence and divergence

- If Eastern Cham lengthening and nasalization are in fact comparable to Vietnamese fast speech reduction…

Phonetic convergence:

- Both languages predictably reduce unstressed syllables
  - Geminate sonorants in the environment of sonorants
  - Homorganic nasals in the environment of obstruents

4. Convergence and divergence

- If Eastern Cham lengthening and nasalization are in fact comparable to Vietnamese fast speech reduction…

Phonological divergence:

- In Vietnamese, this reflects the phonetics of fast speech
- In Eastern Cham, geminate sonorants are contrastive phonemes, so the phonological inventory diverges
  - E.g. /m/ contrasts with /m:/ in fast or slow speech
  - Consonant clusters can violate the sonority hierarchy (e.g. *mt-*)

→Eastern Cham may have phonologized fast speech

- (cf. perhaps English schwa reduction)

4. Conclusion

- Monosyllabization is not a monolithic phenomenon
- Is lengthening/nasalization a contact effect?
  - More research needed on speaker and variety contact
  - Are they typologically frequent?
  - The historical record may or may not be reliable

	Expected for contact effect	Deletion/elision	Lengthening/ Nasalization
1. Earlier variety?	No	**Yes**	?
2. Natural change?	No	**Yes**	?
3. Speaker contact?	Yes	**No**	?
4. Variety contact?	Yes	Yes	?
5. Identical feature?	Yes	**No**	Yes

4. Conclusion

- Finally, a question for future research:
  Are obstruents geminated in a similar manner to sonorants?
- Many speakers describe a difference between pairs like the following
  (Though this could also be an effect of homophone avoidance)
  a) **plɛj* > *plɛj* 'buy'
  b) **pa-plɛj* 'CAUS-buy' > *plɛj* 'sell' (possibly *pːlɛj*)
  (Metalinguistic commentary: "pressed" *p*)
- However, a pilot discrimination task does not suggest that these words are contrastive out of context
- More detailed acoustic and experimental work is needed

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Appendix: Trisyllabic roots

- Both Vietnamese and Eastern Cham have about 1% trisyllabic roots (Trần & Vallée 2009; Lee 1974)
- Eastern Cham trisyllabic roots have the general structure:
  - CV(C).CV̆(C).CV(C)
- The middle presyllable is nasalized: (David Blood 1967: 16)
  - CVN.CV(C)

  →The only sonorants in coda position in both Eastern Cham and VN are nasals

  →Disyllabization brings Cham trisyllabic roots in line with VN disyllabic roots

Eastern Cham trisyllabic > disyllabic roots	
**tamăkaj*	*tamkaj* 'watermelon'
**ɔ̥alĭkɔ*	*ɔ̥ankɔ* 'bee'
**thalĭpăn*	*thampăn* 'nine'

Appendix: *p* ~ *m*

- Presyllables that reduce to *p-* can also be realized as *m-*
  - **pălɛj* > *plɛj* ~ *mlɛj* ‘village’
  - **pilan* > *p̥lan* ~ *m̥lan* ‘month’
  - **p̥ahrɔw* > *p̥raw* ~ *m̥raw* ‘just’
- …Except if the following consonant is also *p-*
  - **păp̥ɛ* > *p̥ɛ* (not *mp̥ɛ*) ‘goat’
- Likewise, those that reduce to *m-* can be realized as *p-*
  - **lipɛj* > *mpɛj* ~ *pɛj* ‘dream’
  - **rip̥ɔŋ* > *mp̥ɔŋ* ~ *p̥ɔŋ* ‘ditch’
  - **m̥ata* > *mta* ~ *pta* ~ *nta* ‘eye’
- …Except if the following consonant is a nasal
  - **mɨnujh* > *mnujh* ~ *nːujh* ‘person’ (not *pnujh*)
  - **limɨn* > *mːɨn* ‘elephant’ (not *pmɨn*)

Appendix: Sonorant length contrast

- Geminates reliably contrast with singleton sonorants in a pilot discrimination task
- Participants (n = 8) listened to audio recordings in a carrier sentence, chose gloss in a forced choice task
- Minimal pairs:
  a) **ămɨ* > *mɨ* 'father' vs. **lĭmɨ* > *mːɨ* 'five', **tămɨ* > *mːɨ* 'enter'
  b) **naj* > *naj* 'come' vs. **pĭnaj* > *nːaj* 'woman'
  c) **ăsaw* > *thaw* 'dog', **thaw* > *t̊haw* 'know'
- Participants reliably distinguished length
  - 88% correct for (a), 100% correct for (b)
- Participants did not reliably distinguish between geminates
  - 43% correct for (a) 'five' vs. 'enter'
- Sonorants are not geminated when V- is deleted
  - 36% correct for (c)

Appendix: Other ages/villages

- Additional 5 speakers for qualitative comparison:
  - 2 older men, 2 from Bình Thuận (more contact with VN), 1 from a Raglai village (less contact with VN)
  - Obviously not a large enough sample, but direction for future study
- Older male speakers
  - DV (52 y.o., farmer): 7% disyllabic roots, *m-* nasalizations (+*p-*) (cf. 4% disyllabic roots in larger sample)
  - DSK (79 y.o., scholar): **30% disyllabic roots**, *m-* nasalizations (+*p-*) →Only speaker in survey to elide word in nasalization class: **lĭthɛj* > *lthɛj* 'cooked rice'
- Bình Thuận speakers (theoretically more VN contact)
  - 2 speakers: **1% disyllabic roots** (1/78); *m-, n-* nasalizations (+*p-*)
- Speaker from Raglai village (higher indigenous population)
  - Speaker: **35% disyllabic roots** (12/34); *m-, n-* nasalizations (+*p-*)