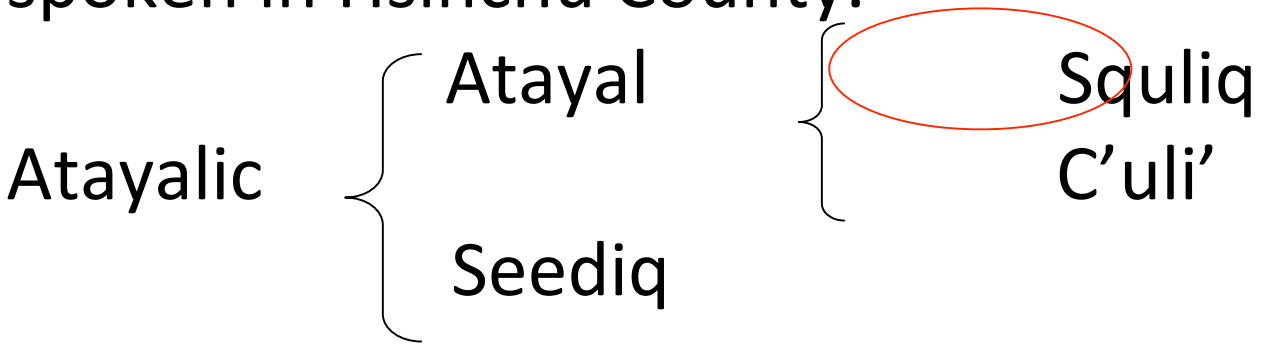
Squliq Atayal Epenthetic Vowels

Hui-chuan J. Huang
hcjhuang@gate.sinica.edu.tw
Academia Sinica
Taipei, Taiwan

CUNY Conference on the Phonology of Endangered Languages
January 12-14, 2011

Introduction

- Atayal is an endangered Austronesian language spoken in northern Taiwan. (population: around 80,000 in 2009)
- The Atayal language can be divided into two major dialect groups, Squliq and C'uli' (Li 1980). The focus of the paper is the Squliq dialect spoken in Hsinchu County.



Background Descriptions of Squliq Phonology (1/3)

1. According to Li (1980), Squliq Atayal inventories include /i e a o u/ and 19 consonants /p t k q ʔ b(β) c͡(ts) s z g(ɣ) x h m n ŋ l r w j/. (The symbol 'c' traditionally represents an apical affricate in the Atayal literature.)
2. Stress generally falls in the final syllable.

Background Descriptions of Squliq Phonology (2/3)

3. Vowels in pre-penultimate positions weaken. The reduced vowels are conventionally omitted in the transcriptions.

Root	*'Active' (AV)*	*'Passive' (NAV)*	*Gloss*
q**i**laŋ	<m>qilaŋ	qlaŋ-an [q**ə**laŋan]	'not feel like…'
k**u**ɣus	k<m>uɣus	kɣus-an [k**ə**ɣusan]	'scrape'
k**a**hul	<m>kahul	khul-an [k**ə**hulan]	'originate'

Note: Egerod (1965) uses the term 'loss of vowel' to describe this reduction phenomenon.

Background Descriptions of Squliq Phonology (3/3)

- Probably because of the convention to omit the weak vowels, there is some confusion regarding whether consonant clusters are allowed in Squliq.
- Li (1980:355) states that 'a phonetic vowel [ə] occurs between consonants'.
- Huang (2006b) explicitly argues that Atayal does not have complex onsets, based on the distribution of onset consonants.

→ Tautosyllabic true consonant clusters are disallowed in the language.

Part 1: epenthetic weak vowels (a preview)

- The present study highlights the fact that the epenthetic weak vowel varies depending on the preceding consonants: it is an apical vowel [ɿ] after /s z͡ts/ and schwa [ə] after other consonants.
- In slow speech, the epenthetic vowel can realize as [ə] after /s z͡ts/, though.
- The influence of /s z͡ts/ on the following vowel is observed <u>not only on epenthetic vowels but also on underlying vowels</u> which undergo pre-penultimate reduction.

Data: epenthetic weak vowels

1. epenthetic apical vowels after /s z̄ t͡s/:

a. squliq [sɪ̲quliq]	‘human being, others’
b. slaq [sɪ̲laq]	‘field’
c. spuŋ [sɪ̲puŋ]	‘measure, evaluate’
d. pcbaq [pə̲t͡sɪ̲βaq]	‘to teach’

2. epenthetic schwas after other consonants:

a. tlipuŋ [tə̲lipuŋ]	‘tail’
b. qthuj [qə̲tə̲huj]	‘fat’
c. ktu’ [kə̲tuʔ]	‘belly’
d. blaq [βə̲laq]	‘good’

The symbol ‘ɪ’ represents an apical vowel here.

Data: reduced vowels

3. Reduced vowels after /s z t͡s/:

a. /sojaʔ, un/	[sɪjon]	‘like, PV’
b. /saβuʔ, an/	[sɪβwan]	‘wrap, LV’

4. Reduced vowels after other consonants:

a. /kitaʔ, an/	[kə̲tan]	‘see, LV’
b. /galuʔ, an/	[gə̲lwan]	‘sympathize, LV’
c. /taruj, an/	[tə̲rujan]	‘tumble down, LV/
d. /paqut, an/	[pə̲qutan]	‘ask, LV’

An Optimality-theoretic analysis

Constraints from Uffmann (2006):

- Dep(F): Output features have a correspondent in the input. (No insertion of features)
- *Multiple: Nodes are dominated by one node exclusively. (No multiple linkage)
- *Skip: Interaction is local. (Segments are not skipped in multiple associations.)
- *Link(C,V): Place features are not linked to both a C-Place and a V-Place node. (No place feature spreading from consonants to vowels)

Epenthesis strategies

- A factorial typology of epenthesis strategies:

  *Multiple >> Dep(F) default epenthesis

  Dep(F) >> *Multiple some kind of spreading

  *Skip >> *Link(C,V) consonantal spreading

  *Link(C.V) >> *Skip vowel harmony

- Coronal consonants are most likely to spread:

  *Link(C,V)/Dor >>

  *Link(C,V)/Lab >>

  *Link(C,V)/Cor

Further distinction among coronals

- The Atayal data seem to call for a further distinction among coronal consonants; coronal sibilants are more likely to spread than nonsibilants.

  *Link(C,V)/Dor >>
  *Link(C,V)/Lab >>
  *Link(C,V)/Cor-NonSibilant >>
  *Link(C,V)/Cor-Sibilant

- A assumption for the following analysis: /s z͡ts/ and the following apical vowel [ɪ] are of the same place features.

Epenthetic weak vowels

1. /slaq/	*Link(C,V)/Cor-NonS	Dep(F)	*Multiple	*Link(C,V)/ Cor-Sib
a. səlaq		*!		
→b.sɪlaq			*	*

2. /tlipuŋ/	*Link(C,V)/ Cor-NonS	Dep(F)	*Multiple	*Link(C,V)/ Cor-Sib
→a.təlipuŋ		*		
b. tɪlipuŋ	*!		*	

- By placing the constraint Dep(F) between two *Link(C,V)/Cor constraints, the asymmetry between sibilant and non-sibilant onsets are captured.
- However, in the case of reduced (underlying) vowels, Dep(F) cannot function to rule out output forms such as [sə] because the schwa vowels are not epenthetic.

→ the selection of [sɪ] rather than [sə] must be forced by some other constraint(s).

- Idea: It seems the articulatory gestures of /s z͡ts/ are more likely to extend to the following weak vowels in connected speech.

Proposal:

Lag(Coronal Sibilant/Place): Coronal sibilants share place features with the following vowels.

→ can be viewed as a type of context-sensitive markedness constraint.

- With the addition of the Lag constraint, we need not distinguish two *Link(C,V)/Cor constraints, and Dep(F) can be ranked at the bottom to show that inserting schwa is the default strategy.

Reduced (underlying) vowels:

1. /sojaʔ, un/	Lag(Coronal Sib/Place)	*Multiple	Dep(F)
a. səjon	*!		
→b.sɪjon		*	

2. /taruj, an/	Lag(Coronal Sib/Place)	*Multiple	Dep(F)
→a.tərujan			
b. tɪrujan		*!	

Epenthetic Vowels: (modified analysis)

1. /slaq/	Lag(Coronal Sib/Place)	*Multiple	Dep(F)
a. səlaq	*!		*
→b.sɪlaq		*	

2. /tlipuŋ/	Lag(Coronal Sib/Place)	*Multiple	Dep(F)
→a. təlipuŋ			*
b. tɪlipuŋ		*!	

- In slow speech: re-ranking of Lag (Coronal Sib-Place) below *Multiple leads to the output [səlaq] and [təlipuŋ].

Discussion

- It is necessary to employ a context-sensitive markedness constraint such as Lag(Coronal Sibilant/Place) in order capture the influence of coronal sibilants on the following epenthetic or underlying vowels.
- The modified OT analysis shows that schwa insertion, rather than consonantal assimilation, is the default epenthesis strategy in Squliq.

Part 2: another potential case of epenthetic vowels in Squliq

- There is, in fact, little explicit discussion on vowel epenthesis in Atayal languages (except the two Master's theses by Lambert 1999 and Lin 2004).
- The type of vowel epenthesis mentioned in Lambert 1999 and Lin 2004 involve an inserted vowel that breaks up consonant clusters that are not root-final, e.g. /ptaʒuaɣ/ [p**a**taʒuaw] 'work' (from Lambert 1999, focusing on the Mabalay variety of C'uli' Atayal)

Epenthesized full vowels: a preview

- The present study would like to show the possibility that some underlying forms must be analyzed as containing root-final **CC**, and that vowel epenthesis takes place to break up root-final consonant clusters.
- The epenthetic vowel occurs only in the final/stressed syllable and is realized as [u] on the surface.

Motivation for the epenthesis account

- The motivation for the epenthesis analysis comes from the regular and apparently irregular patterns of pre-penultimate vowel reduction in the literature.

Data: Some /u/'s remain unreduced in the penult (regular pattern)

	AV	*AV.Imp.*	*PV./LV.*	*Gloss*
(1)a.	<m>aq**u**t	paqut	pəq**u**t-an	'to ask'
b.	q<əm>al**u**p	qalup	qəl**u**p-an	'to hunt'
c.	<m>um**u**k	umuk	m**u**k-an	'to cover'
d.	s<ɪm>aβ**u**ʔ	saβuʔ	sɪβ**u**-an	'to wrap'

Some other /u/'s appear to reduce even in the penult

(2)	*AV*	*AV.Imp.*	*PV./LV.*	*Gloss*
a.	<m>ah**u**q	βahuq	βəh**ə**q-un	'wash'
b.	t<əm>ah**u**k	tahuk	təh**ə**k-un	'cook'
c.	teh**u**k		təh**ə**k-un	'arrive'
d.	gəl**u**w		l**ə**g-an	'share'
e.	<mə>həm**u**t		həm**ə**t-an	'to act indiscriminately'

Vowel reduction exceptions-- problematic

- The contrast between (1) and (2) poses a serious problem in the analysis of pre-penultimate vowel reduction in Atayal because the words in (2) are exceptions to the vowel reduction generalizations.

- Egerod (1965) included 19 words to illustrate this exceptional pattern.

Observations of the data

- Among the 19 words (called extra-reduced stems in Egerod's work), up to 17 of them contain the vowel [u] in the final syllables of the unsuffixed stems.

  In the remaining two words, there are variations regarding whether the penultimate vowels are reduced.

maɣal	ɣalan or ɣlan	'take'
malax	laxan or ʔlxan	'give up'

Motivations for the epenthesis account

- The study proposes that in data (2), the [u] vowel in the final syllable of the stem is epenthetic. The epenthetic vowel is realized as [u] in the final syllable, but as [ə] in other positions.

	/tahk/	/tahk, an/
Epenthesis	tah**u**k	tah**ə**kan
Vowel reduction	-----	t**ə**həkan

The epenthesis account

- Vowel epenthesis takes place to avoid ill-formed consonant clusters on the surface.

(informal) Rules for Squliq:

null → [u] / C___C in final syllables

null → [ə] / C___C elsewhere

Interim summary (1/2)

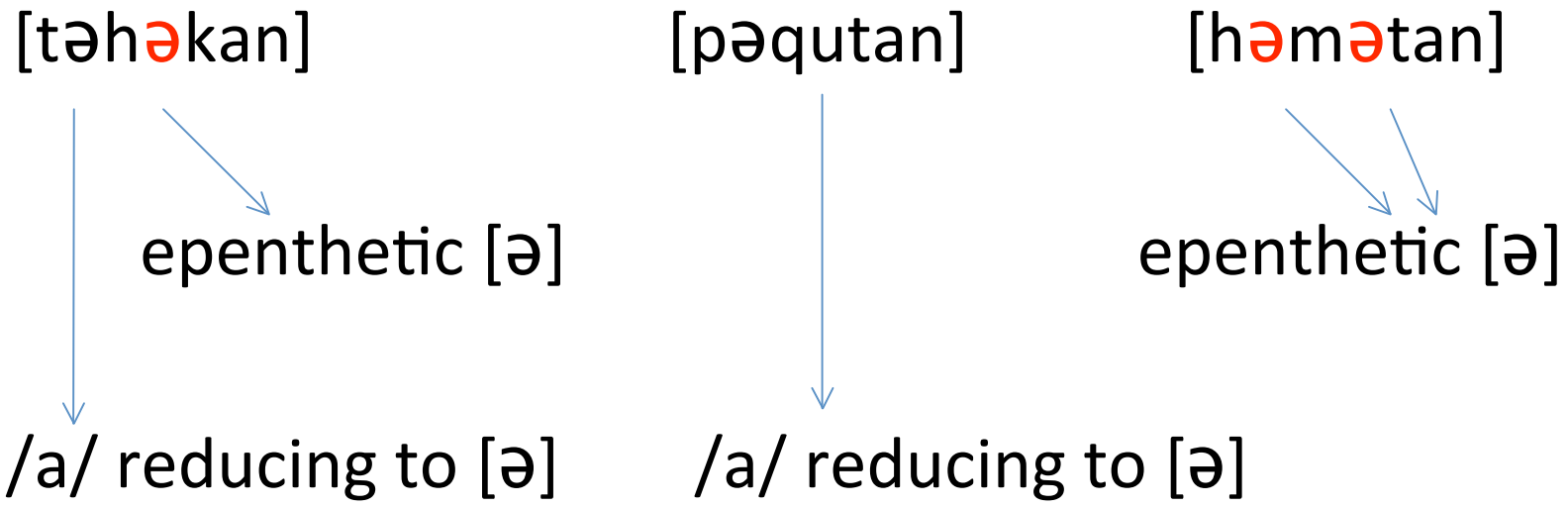
- The contrast between data (1) and (2) supports the epenthesis account in the synchronic phonology of the language.

  In (1), the underlying [u] vowel in the final syllable of the root remain a full vowel in the penult of the suffixed forms because reduction affects only pre-penultimate vowels.

  In (2), the vowel in the final syllable of the root is inserted, which is realized as [ə] in words such as [təhə̲kan] because [ə] is the default epenthetic vowel.

Interim summary (2/2)

(1) The data (2) are previously mistaken to involve irregular vowel reduction because both the reduced vowel and the epenthetic vowel (in nonfinal syllables) are schwa [ə] in the language.



Discussion

- The proposed analysis argues that the quality of the epenthetic vowel varies depending on their positions within a word.
- Is this rule ad hoc?

  null → [u] / C___C in final syllables

- Li (1981:270) mentions that Proto-Austronesian *ə becomes /u/ in the final syllable in all Atayalic dialects.

An alternative analysis

- In light of the historical sound change, it would be possible to assume that the contrast between data (1) and (2) is due to the difference in the underlying vowels of the final syllable of the root:

	Root	*AV.*	*NAV.*	*Gloss*
(1)a.	/paqut/	<m>aq**u**t	pəq**u**t-an	‘to ask’
b.	/qalup/	q<əm>al**u**p	qəl**u**p-an	‘to hunt’
(2)a.	/βah**ə**q/	<m>ah**u**q	βəh**ə**q-un	‘wash’
b.	/tah**ə**k/	t<əm>ah**u**k	təh**ə**k-un	‘cook’

The alternative analysis

- In this alternative analysis,

  (1) No vowel epenthesis rule exists to break up underlying root-final CC. However, a rule changing /ə/ to [u] in the final syllable in the synchronic grammar is still needed.

  (2) an additional underlying vowel /ə/ is needed.

Discussion

- It seems that it is difficult to choose between the two competing analyses for Squliq.
- If the epenthesis account reflects the truth, speakers must have restructured their underlying forms (developing root-final CC) and come up with the rule 'null→ [u] in the final syllable'.

Discussion

- An examination of the related Atayal dialects may support the possibility that Squliq has developed an epenthetic account.
- In Mabalay Atayal, the corresponding regular and irregular patterns of vowel reduction exist, but the epenthetic vowel is [a] in Mabalay. The alternative underlying account, which posits an extra /ə/ phoneme, would not help because the epenthetic vowel is [a].

  t<am>ah**u**k c<in>.h**a**k-an 'cook'

Mayrinax: regular and irregular vowel reduction

Regular pattern:

AV	*PV./LV.*	*Gloss*
a. c<um>aβuʔ	caβ**u**ʔ-un	'wrap'
b. ʔ<um>umuk	ʔum**u**k-an	'cover'

Irregular pattern:

c. ma-βah**u**q	βah.q-an	'wash'
d. t<um>ah**u**k	tah.k-an	'cook'

In Mayrinax Atayal, the phonemic schwa in the proto-language is lost. The rule 'null→ [u]/ C__C in the final syllable' is still required.

Conclusion

- The realization of weak epenthetic vowels as either [ə] or [ɪ] in Squliq depends on the preceding consonants.
- A context-sensitive markedness constraint can account for the realization of both epenthetic and reduced weak vowels.
- Squliq might contain an epenthesis rule which realizes the inserted vowel as [u] in final/stressed syllables.

Selected References:

- Egerod, Soren. 1965. Verb inflexion in Atayal. *Lingua* 15: 251-282.
- Egerod, Soren. 1980. Atayal-English Dictionary. Scandinavian Institute of Asian Studies Monograph Series No. 35. Curzon Press.
- Huang, Hui-chuan J. 2006b. Squliq Atayal Syllable Onset: Simple or Complex? In *Streams Converging Into an Ocean: Festschrift in Honor of Professor Paul Jen-kuei Li on His 70th Birthday*, ed. by Henry Y. Chang, Lillian M. Huang, and Dah-an Ho, pp. 489-505.
- Lambert, Wendy Mae. 1999. Epenthesis, Metathesis, and Vowel-Glide Alternation: Prosodic Reflexes in Mabalay Atayal. Master's Thesis, National Tsing Hua University.
- Li, Paul Jen-kuei. 1980. The phonological rules of Atayal dialects. *Bulletin of the Institute of History and Philology* 51.2:349-405. Taipei: Academia Sinica.
- Li, Paul Jen-kuei. 1981. Reconstruction of Proto-Atayalic phonology. *Bulletin of the Institute of History and Philology* 52.2:235-301. Taipei: Academia Sinica.
- Lin, Wan-ying. 2004. Vowel Epenthesis and Reduplication in Squliq and C'uli' Atayal Dialects. Master's Thesis, National Tsing Hua University.
- Uffmann, Christian. 2006. Epenthetic vowel quality in loanwords: Empirical and formal issues. *Lingua* 116: 1079-1111.