Glide Strengthening in Atayal: Sonority Dispersion and Similarity Avoidance

Hui-chuan J. Huang
Academia Sinica

Diachronic descriptions of lenition and fortition are more common than synchronic ones in the phonological literature despite that they are synchronically active in a number of languages (De Carvalho et al. 2008). This paper presents the data of Atayal glide strengthening, showing how Sonority Dispersion Principle (SDP, Clement 1990) and the constraint on homorganic glide-vowel sequences play a role in leading to the observed patterns in its synchronic grammar. The Atayal data support the idea that schwa is less sonorous than high peripheral vowels (Kenstowicz 1997). A further examination of different Atayal dialects shows that glides /j w/ can have different behavior, with /w/ being less sonorous or more consonantal than /j/.

Glide strengthening in Atayal (Austronesian, Taiwan) has not been reported in the literature except in Huang (2015). It is argued in Huang (ibid) that the voiced coronal fricatives [z, ʑ], which are assumed to belong to /z/ in previous studies, are actually allophones of phonemic /j/ in onset position through strengthening. The strengthening of /j/ to [z] before schwa is attributed to the requirement of optimizing the sonority profile of the onset-nucleus demisyllables, and /j/ fricativizes to [ʑ] before /i/ due to insufficient spectral changes in the sequence. In the present study, the behavior of both /j w/ glides in Squliq Atayal are examined. It is shown that while /j w/ in Jianshi Squliq strengthen respectively to [z, ʑ] and [ɣ] before weak/reduced and homorganic vowels, in Taoshan Squliq [wə] remains unaffected despite that /j/ undergoes strengthening, e.g. Jianshi Squliq /juŋi/ [juŋiʔ], /juŋi, an/ [z̩ŋjan] ‘forget,’ /RED, wagiq/ [ɣə̲~waɣiq] ‘tall,’ but Taoshan Squliq /juŋi/ [juŋiʔ], /juŋi, an/ [z̩ŋjan] ‘forget,’ /RED, wagiq/ [wə̲~waɣiq] ‘tall.’

To formalize the phenomenon of glide strengthening in Jianshi Squliq, it is proposed that two types of OT constraints capture the motivations of the strengthening. The first is a family of constraints that conjoin peak and margin hierarchies (Prince and Smolensky 1993). Under the assumptions that Margin Hierarchy is divided into to two, one referring to onset and the other to coda (Smith 2003, Parker 2002), the conjoined constraint *O/G&*P/ə (*Onset/Glide&*Peak/ə) ranks higher than all the other combinations because constraint conjunction follows the inherent rankings of their component constraints: Peak Hierarchy *P/ə >> *P/i,u >> *P/e,o >> P/a and Onset Hierarchy *O/Glide >> *O/Liquid >> *O/Nasal >> *O/Obstruent (as shown in (1) below).

The high ranking of *O/G&*P/ə motivates the changes of *jə and *wə to [z̩][1] and [ɣə] in Jianshi Squliq. The well-formedness of *wə* sequence in Taoshan Squliq suggests that *O/G&*P/ə needs to be further differentiated based on the identities of the glides. Given that

[1] The expected [zə] usually further become [z̩] with an apical vowel due to assimilation of the weak nucleus to the preceding sibilant.

/i/ is more sonorous than /u/ (Krämer 2003 and the references therein; Hsu 2003), it is reasonable to assume that the corresponding glide [w] is lower in sonority than [j], which accounts for the acceptable *wə* sequence in Taoshan Squliq since it better satisfies SDP than *jə. The fact that lip rounding and tongue positioning are not physically related may also facilitate the pronunciation of [wə] in Taoshan Squliq.

The second type of constraints rules out homorganic sequences *ji and *wu in Atayal. Kawasaki (1982) shows that the rarity of labial or labialized consonants followed by rounded vowels and the rarity of dental/alveolar/palatal or palatalized consonants followed by front vowels are related to the insufficient spectral changes within such sequences. In the present study it is proposed that the concept of similarity avoidance underlies the sequence constraints *ji/*wu. The glides /j w/ are identical to vowels /i u/ in place features; so are other coronal and dorsal consonants to /i u/. However, only *ji/*wu (but not, e.g., *ku*) trigger consonantal modifications because glides and vowels are similar in features. To summarize, the rankings of *ji/*wu and *jə/*wə above IDENT-[sonorous] account for glide strengthening in Jianshi Squliq. In Taoshan Squliq, IDENT-[sonorous] is ranked below *ji/*wu and *jə but above *wə.

(1) Deriving the relatively higher-ranked *O/G&*P/ə (i.e. *jə, *wə in Atayal); both the symbols '»' and '↓' mean 'rank higher than' here:

a. *O/G&*P/ə	» *O/L&*P/ə	» *O/N&*P/ə	» *O/Obs&*P/ə
↓	↓	↓	↓
b. *O/G&*P/i,u	» *O/L&*P/i,u	» *O/N&*P/i,u	» *O/Obs&*P/i,u
↓	↓	↓	↓
c. *O/G&*P/e,o	» *O/L&*P/e,o	» *O/N&*P/e,o	» *O/Obs&*P/e,o
↓	↓	↓	↓
d. *O/G&*P/a	» *O/L&*P/a	» *O/N&*P/a	» *O/Obs&*P/a

(2) Data (Jianshi Squliq, showing prepenultimate vowel reduction):

a.	m**j**aŋiʔ	[mə**j**aŋiʔ]	p**z**ŋi-un	[pə**z**ɳɲjun]	'sick for a long time'
b.	h<m>**w**iruʔ	[həmə**w**iruʔ]	h**g**ru-an	[hə**ɣ**ərwan]	'to circulate, go around'
c.	mcsaga**w**	[mətsɳsaɣa**w**]	pcsa**g**-un	[pətsɳsa**ɣ**un]	'proud'
d.	tha**j**	[təha**j**]	tha**z**-i	[təha**ʑ**i]	'remain'

Selected references:

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