

The Morphologization of Liaison Consonants in Taiwan Min and Taiwan Hakka^{*}

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A liaison consonant is a consonant resulting from the spreading of the final consonant of a syllable to the initial position of an onsetless particle. This study investigated whether such derived consonants are recognized by native speakers of Taiwan Min and Taiwan Hakka. Results of a concept formation and a syllable inversion experiment with Taiwan Min subjects are taken from Wang & Kao (2004). A syllable inversion experiment was done with Taiwan Hakka subjects. The results showed variant treatments by users of different languages. Taiwan Min speakers tended not to regard the liaison consonants as existing in the particle, while Taiwan Hakka speakers tended to accept their existence. And within Hakka, speakers using Sixian variety tended to accept the consonants more than Hailu speakers. We argue that such gradient performances show different degrees of morphologization of the consonants in the particles.

Key words: liaison consonants, Taiwan Min, Taiwan Hakka, morphologization, syllable inversion experiment

1. Liaison consonant as the onset consonant

It has been generally observed that an onsetless syllable tends to attract the coda consonant of the preceding syllable to become the onset of the syllable. The most well-known example is the liaison phenomenon in French where the coda consonant of a syllable is kept when the word is followed by an onsetless syllable (*petit enfant* [pətitãfã]), whereas it is deleted when the word is followed by a word beginning with a consonant (*petit garçon* [pətigarš]). The retention of the consonant is attributed to its

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being resyllabified as the onset of the following syllable, resulting in a CVX syllable. A similar example is also observed in English. In Shakespeare's time,¹ the attributive *mine* was used before vowels, while *my* was used before consonants.² Obviously, the *n* in *mine* was retained because it spreads to the onset of the next syllable and links the genitive with the following vowel. The two variants of the indefinite article *a* and *an* in present-day English have exactly the same story.

This liaisoned onset may become lexicalized through misanalysis. This is how the *n* in *nickname* came about. *Nickname* was *ekename* ('other name') in Middle English, without the initial *n*. The word acquired the initial *n* by analyzing *an ekename* as *a nekename*, hence *nickname*.³

2. Liaison consonants in Mandarin

Mandarin has also been observed to have liaison consonants for the onsetless particle 啊 [a]. This is how L.-S. Chung (1966:129-131) generalizes the phenomenon: "The particle 啊 expresses exclamation. It changes its sound according to the coda of the preceding word." (Our translation). Thus,

- (1) a. [a] becomes [ja] 呀 after single vowels (except [u]), and diphthongs ending in [i]: *pian yi ya* (便宜呀), *you qu ya* (有趣呀), *hui jia ya* (回家呀), *bu cuo ya* (不错呀), *shang ke ya* (上课呀), *shang xue ya* (上学呀), *lai ya* (来呀), *dui ya* (对呀).
- b. [a] becomes [wa] 哇 after single vowel [u] and diphthongs ending in [u]: *hao ku wa* (好苦哇), *zao gao wa* (糟糕哇), *bie zou wa* (别走哇).
- c. [a] becomes [na] 哪 after rhymes ending in [n]: *tian na* (天哪), *ben na* (笨哪).
- d. [a] becomes [ŋa] after rhymes ending in [ŋ]: *bang mang a* (帮忙啊), *deng deng a* (等等啊).
- e. [a] becomes [ʒa] after retroflex vowels: *jin zhi a* (盡職啊), *kuai chi a* (快吃啊), *shi a* (是啊).
- f. [a] becomes [za] after apical vowels: *xie zi a* (寫字啊), *ru ci a* (如此啊), *bu pa si a* (不怕死啊).

¹ According to *The Oxford English Dictionary*, *mine* was used before vowels until the 18th century.

² CHARMIAN: 'I had rather heat *my* liver with drinking.' (*Cleopatra* Act I Scene II)
CHARMIAN: 'Nay, if an oily palm be not a fruitful prognostication, I cannot scratch *mine* ear.'
(*ibid.*)

³ The word *apron* went the opposite way. It was *napron* in Middle English, and became *apron* by losing its initial *n* to the indefinite article.

As can be seen, the first three variants are signified by different written characters, whereas the next three variants are not. This is because [ŋa], [za] and [ʒa] are illegitimate Mandarin syllables; thus these latter three liaison consonants remain phonetic. The fact that the first three variants are written with separate characters shows that the native speakers are aware of the existence of the liaison consonants. Such realization may result in the fossilization of the liaison consonants.

In our judgment, some of these cases seem to have been fossilized. If we examine the cases in the first variant (1a), [ja] 呀 does not just follow words ending in [i] ([p^hiɛn ji ja] ‘便宜呀’), [y] ([jou tɕ^hy ja] ‘有趣呀’) or [j] ([lai ja] ‘來呀’). It also follows other single vowels except [u]. These include [a] ([huei tɕja ja] ‘回家呀’), [o] ([pu ts^huo ja] ‘不錯呀’), [ɤ] ([saj k^hɤ ja] ‘上課呀’), and [ɛ] ([saj ɕɛ ja] ‘上學呀’). The general rule for the coda to spread to the onsetless syllable does not provide an explanation for these cases. [ja] may be collocated with these vowels.

But collocation does not tell the whole story either. A Google search (on July 27, 2009) for ‘好呀’ [hau ja] resulted in about 5,400,000 hits, whereas a similar search for ‘好哇’ [hau wa] resulted in only 769,000 hits.⁴ A search for ‘天呀’ [t^hiɛn ja] also resulted in about 1,220,000 hits, although ‘天哪’ [t^hiɛn na] yielded about 7,300,000 results. What is even more amazing is the use of [wa] ‘哇’. Google searches showed such examples as ‘天哇’ [t^hiɛn wa], ‘看哇’ [k^han wa], and ‘神哇’ [ʃən wa].⁵ These examples with ‘哇’ [wa] were primarily by Mainland Chinese netters. It is not clear whether a particular meaning or usage is associated with [wa] ‘哇’ in these cases, but it is clear that whatever the cause it could not have resulted from the liaison rule. Thus it seems that at least in some usages the particles with liaison consonants have been fossilized.

⁴ For the searches the “strict” criterion was used. That is, these keywords were searched with quotes (e.g. “好呀”) so that the results only included those expressions where these keywords come immediately next to each other.

⁵ Some examples are:

‘學 會 瑜 伽 基 本 動 作 大 概 需 要 多 少 天 哇?’
xue hui yujia jiben dongzuo dagai xuyao duoshao tian wa?

‘How many days does it take approximately to learn the basic moves of Yoga?’

‘進 來 看 看 哇!’

jinlai kankan wa!

‘Come in and take a look!’

‘額 滴 (我 的) 神 哇!’

edi shen wa!

‘My God!’

3. The status of the liaison consonants

The examples in the previous section show that the onsetless syllables tend to acquire an onset consonant from the coda of the previous syllable. However, the status of the acquired liaison consonant is different in each case. The French liaison consonant and the Shakespearean *mine* are phonological, as the acquired onset consonant does not result in a different underlying phonological representation. The case of *nickname*, on the other hand, is a case where we consider the acquired consonant ‘lexicalized’, as the consonant has become part of the lexical representation.

The case of Mandarin particle [a] is more complicated. Some liaison consonants, such as [ŋ-], [ẓ-] and [z-], remain phonetic, as they are not realized by the speaker. But in the case of ‘呀’ [ja], ‘哇’ [wa], ‘哪’ [na], the situation is not so clear. Although they originated as phonetic consequences of linking the final consonant with the following onsetless syllable, the usage seems now based mostly on collocation at best. Even so, it is not uncommon for the speakers to depart from such collocation practice. For example, a Google search for the recently popularized term ‘噗浪’ [p^hu laŋ] ‘plurk’ (or incorrectly ‘撲浪’) showed that the [a] form following the word was mostly ‘啊’ [a] ([p^hu laŋ a] ‘噗浪啊’), as expected by the liaison rule. However, there was still about one tenth of the time when the [a] form was rendered as ‘呀’ [ja] ([p^hu laŋ ja] ‘噗浪呀’).⁶ It seems that the choice is a matter of preference rather than a rule. In our evaluation, the particle has developed from a phonological phenomenon to a morphological phenomenon, although the morphological operation of the variants is still not yet stabilized.

In the next section, we shall present another case of liaison consonants in two Chinese languages in Taiwan. The liaison also occurs between a coda consonant and a following onsetless particle. The results of the study shows that the process is being morphologized to different degrees.

⁶ [na] ‘哪’ and [wa] ‘哇’ forms were not found used with ‘噗浪’.

4. Liaison consonants in Taiwan Min⁷

Taiwan Min is a Southern Min dialect spoken in Taiwan. As one of the Chinese languages, Taiwan Min has been observed to have the similar phenomenon where the coda of a syllable is spread to the following particle (Cheng 1997:137, Chiang 1992: 22-62, R.-F. Chung 1996:122, Hung 1996:226, Lin 1989:137, Yang 1991:135-136, Zhang 1989:129). Yang (1991:135), for example, states that “if the following word is an onsetless particle, the prevocalic glottal stop is lost, and because of the influence of *-p*, *-t*, *-k* of the previous word, a prevocalic *b*, *l*, or *g* is produced.” (Our translation). As a matter of fact, not only the oral stop codas (so called ‘entering tones’) but also the nasal codas *-m*, *-n*, *-ŋ* give rise to the prevocalic onset of the following particle. The following examples are given:⁸

- | | |
|--|--|
| (2) diminutive particle <i>-a</i> | |
| ap + a → ab ba | ‘box’ |
| ts ^h at + a → ts ^h ad la | ‘thief’ |
| lɔk + a → lɔg ga | ‘deer’ |
| kam + a → kam ma | ‘orange’ |
| kun + a → kun na | ‘stick, rod’ |
| kɔŋ + a → kɔŋ ŋa | ‘(water) pipe’ |
| cf. be + a → be a | ‘wheat’ |
| (3) perfective marker <i>-a</i> | |
| hip + a → hib ba | ‘have photographed’ |
| ut + a → ud la | ‘have ironed’ |
| pak + a → pag ga | ‘have tied’ |
| am + a → am ma | ‘have become dark (refer to daylight)’ |

⁷ One reviewer questions the use of the term ‘liaison’, as it is noncommittal—whether the middle consonant is singleton (CVCV) or geminate (CVCCV). We want to point out, as explained in footnote 9 below, that all previous studies recognize an onsetless particle underlyingly, and a particle with an onset in the surface structure. The argument was whether to treat the surface onset as geminate consonants, as an ambisyllabic consonant, or as a resyllabified consonant. Our study explores the possibility for the surface onset to become underlying. If the onset becomes underlying, then the structure becomes CVCCV, that is, the middle consonants are geminate. Before such a conclusion is reached, the use of the term is necessarily noncommittal.

⁸ In these examples, the tones are omitted, as they are irrelevant to the discussion. Among these particles, the diminutive particle in (2) has a high falling tone [51]; the perfective marker in (3) and the adjective marker in (4) are toneless, as they acquire the tone from the previous syllable; the classifier in (5) has a low rising tone [13].

	kun + a → kun na	‘have boiled’
	kəŋ + a → kəŋ ŋa	‘have spoken’
cf.	tsia + a → tsia a	‘have eaten’
(4) adjective marker <i>-e</i>		
	hap + e → hab be	‘closed’
	tit + e → tid le	‘straight’
	p ^h ak + e → p ^h ag ge	‘sunned’
	kiam + e → kiam me	‘salty’
	wan + e → wan ne	‘crooked’
	tŋ + e → tŋ ŋe	‘long’
cf.	ɔ + e → ɔ e	‘black’
(5) classifier <i>-e</i>		
	tsap + e → tsab be	‘ten’
	tsit + e → tsid le	‘one’
	lak + e → lag ge	‘six’
	tsit ban + e → tsit ban le (ne)	‘ten thousand’
	ŋŋ + e → ŋŋ ge (ŋe)	‘two’
cf.	gɔ + e → gɔ e	‘five’

4.1 The psychological realization of liaison consonants in Taiwan Min

Wang & Kao (2004) used two experiments to test the native speakers’ realization of the liaison consonants.⁹ In the concept formation experiment, six conditions were set up.¹⁰ The six conditions were [b, l, g, m, n, ŋ, Ø], where ‘Ø’ referred to ‘no onset’. The subjects in each condition were trained to respond to the onset consonants in the second syllable of two-syllable word stimuli. For example, the subjects in the [b] condition were trained to respond positively to [sin bun] ‘news’ and negatively to [tien si] ‘television’. After the subjects had recognized the sound they were trained to recognize, they were

⁹ Wang & Kao (2004) was the only study that tested whether the speakers realized the liaison consonants. Previous studies concerning the liaison consonants, such as Chiang (1992), Chung (1996), Lin (1989), S.-P. Wang (1992), were all about whether to represent the liaison consonant as geminate consonants or ambisyllabic consonant or resyllabified onset consonant. These studies all recognized that the particles are underlyingly onsetless, and that there are onsets at the surface level. As our concern is whether the surface onsets have become morphologized and hence underlying, these previous studies are not relevant and hence not discussed.

¹⁰ For an explication of the concept formation experimental technique, see Jaeger (1986).

tested on how they reacted to the items with liaison consonant such as [ap ba] ‘box’. The results of the experiment showed that, except for the [l] group who recognized the liaison [l] 87% of the time, the other five groups, including the ‘no onset’ group, recognized 52-61% of the time.¹¹

In the second experiment, the subjects were given two-syllable words and were asked to reverse the syllables. For example, [tsau k^ha] ‘kitchen’ was expected to be reversed as [k^ha tsau]. The results showed that of the two-syllable words with diminutive particle *-a*, only 14% were reversed carrying onset (that is, [lɔŋ ga] ‘deer’ was reversed as [ga lɔk] rather than [a lɔk]). The other 86% responses remained onsetless (that is, [lɔŋ ga] ‘deer’ was reversed as [a lɔk]). And of the two-syllable words with classifier particle *-e*, close to 14% of the items were responded with an onset prefixed to the particle. The other 86% of the items were responded without an onset. The results from these two particles were almost identical, therefore it was concluded that morpheme categories did not affect the realization of the liaison consonants.

These two experiments showed discrepant results. The concept formation experiment showed that more than 50% of the time the subjects recognized the particle as carrying an onset, whereas the syllable inversion experiment showed that only 14% of the time the subjects regarded the particle as carrying an onset. Wang & Kao argued that the results from the concept formation experiment was equivocal, as the positive answers were around 50-60% and were hardly definitive. As they suggested (p.827), “the subjects might have realized the existence of the onset in the suffix, but the realization may not have been enough for them to recognize the onset as an individual phoneme, with the exception of perhaps [l].” They argued that the results from the syllable inversion experiment were more indicative of the native speakers’ realization of the phenomenon, and that because the speakers have shown awareness of the onset, the onsets are *en route* to being lexicalized (morphologized).¹²

In the next section, we study a similar phenomenon from another Chinese language spoken in Taiwan: Hakka. The purpose of the study is to compare the phenomena in both Taiwan Min and Taiwan Hakka and see whether they differ in terms of degrees of morphologization. A syllable inversion experiment similar to that in Wang & Kao was conducted.

¹¹ The ‘no onset’ group had the lowest 52%. This means that of the test items with liaison consonants they agreed 52% of the time these items did not contain an onset.

¹² Wang & Kao (2004) used the term ‘lexicalization’ to refer to the phenomenon of the surface consonant becoming underlying, as in the case of *nickname*. But the phenomenon discussed here does not happen to just one lexical item, but to several particles, hence ‘morphologization’ is probably a more appropriate term. We would like to thank Mary Beckman for suggesting the use of this term.

5. Liaison consonants in Taiwan Hakka

Luo (1988) presents four particles that give rise to liaison consonants:¹³

(6) diminutive nominal particle *-e* (p.101)

su + e → su ve	‘tree’
sam + e → sam me	‘three’
san + e → san ne	‘mountain’
iuŋ + e → iuŋ ŋe	‘bear’
lip + e → lip pe	‘hat made of bamboo leaf’
mat + e → mat te	‘socks’
vuk + e → vuk ke	‘house’

(7) question particle *-e* (p.91)

k ^h on + e → k ^h on ne	‘did (you) see?’
ho + e → ho ve	‘finished?’
suk + e → suk ke	‘cooked?’

(8) perfective marker *-e* (p.91)

k ^h on + e → k ^h on ne	‘have seen’
ho + e → ho ve	‘have finished’
suk + e → suk ke	‘have cooked’

(9) adjective marker *-e* (p.92)

ho + e → ho ve	‘good’
suk + e → suk ke	‘cooked’

These various particles, all with vowel [e], carry different tones. What is similar among them is that they all give rise to liaison consonants. Thus this is also where we might be able to observe whether or to what extent these liaison consonants have been morphologized.

¹³ Here again, the tones are omitted. In the Sixian variety, represented by Miaoli, the diminutive nominal particle in (6) has [31] tone, the question particle in (7) has [21] tone, the perfective marker in (8) has tone [21], the adjective marker in (9) has tone [55]. In the Hailu variety, represented by Zhudong, the diminutive nominal particle in (6) has [55] tone, the question particle in (7) has tone, the perfective marker in (8) (with particle *-le* rather than *-e*) has tone [53], the adjective marker in (9) has tone [21].

5.1 The syllable inversion experiment

Following Wang & Kao (2004), we did a syllable inversion experiment. For this experiment we recruited 62 native speakers from Miaoli (苗栗) area,¹⁴ 62 from Zhudong (竹東) area,¹⁵ and 22 from Meinong (美濃) area. These subjects were mostly government employees, employees of China Petroleum Company, and school teachers. The reasons why subjects from three different areas were recruited are two-fold. First, according to Luo (1990:74-76), the Hakka spoken in Miaoli and Meinong belongs to the Sixian (四縣) variety, whereas the Hakka spoken in Zhudong belongs to the Hailu (海陸) variety.¹⁶ We wanted to see if this dialectal difference was a significant factor in the realization of the liaison consonants. Second, although Miaoli and Zhudong belong to different Hakka varieties, they are geographically closer to each other in the central-north part of Taiwan, whereas Meinong is in the southern part of Taiwan. We wanted to see if the geographic separation caused any difference between Miaoli and Meinong.

In this experiment we asked the subjects to reverse the two-syllable words. Stimuli included 72 two-syllable words, half of which (36) were filler items and the other half were words with liaison consonants. These latter 36 test items included three types of words, each type with 12 items. The first type was nouns with diminutive particle *-e*, such as [kiap be] ‘tweezers’ ([kiap bə] for Zhudong speakers).¹⁷ The second type was adjectives with marker *-e*, such as [son ne] ‘sour’. The third type was verbs with perfective marker *-e*, such as [koŋ ŋe] ‘have spoken’. The liaison consonants involved were [p(b), t(l), k(g), m, n, ŋ]. Thus each consonant appeared twice in the 12 items in each type. All 72 items were randomized and presented to the subjects through a tape-recorder. The subjects were asked to repeat the stimuli first and then give the response by reversing the two syllables. All test sessions were tape-recorded for future verification.

¹⁴ Of the 62 Miaoli subjects, 50 were female and 12 were male, with ages ranging from 33 to 69, with an average age of 51.45 and standard deviation of 8.38.

¹⁵ Of the 62 Zhudong subjects, 39 were female and 23 were male, with ages ranging from 39 to 64, with an average age of 51.95 and standard deviation 6.59.

¹⁶ According to Luo (1990: Ch.8), Sixian and Hailu Hakka differ from each other primarily in terms of tones (cf. footnote 13). There are also differences in vowels. The Hailu variety has an extra palatal onset consonant series compared to Sixian. Since these features are not our concern, we shall skip the discussion. The relevant difference in this connection is that the Hailu variety (represented by Zhudong) uses [ə] instead of [e] as the diminutive nominal particle.

¹⁷ Although Luo (1988) gives voiceless liaison consonants following voiceless codas, in the dialects under investigation the liaison consonants are actually voiced.

5.1.1 Results from Miaoli subjects

The following tables show the accumulated responses made to various types of stimuli. In these tables, ‘Cat.’ is the morphological category of the stimulus word (N=Noun, A=Adjective, V=Verb), the ‘Zero onset’ column shows the number of answers where the reversed particle did not contain an onset ([vuk ge] was reversed as [e vuk]), the ‘Onset’ column shows the number of answers where the reversed particle contained an onset which was expected ([vuk ge] was reversed either as [ke vuk] or as [ge vuk]),¹⁸ the ‘%’ column shows the percentage of the ‘Onset’ answers among the total answers, and the ‘Other’ column shows other answers ([vuk ge] may be reversed as [le vuk]).¹⁹ As there were 62 subjects in the test, the total number of answers to each item was 62.

(10) Stimuli with roots ending in [p]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kiap e	夾子	28	28	45%	6	62
N	hap e	盒子	31	26	42%	5	62
A	kiap e	夾的	31	22	36%	9	62
A	sap e	燙的	29	29	47%	4	62
V	kiap e	夾了	28	20	32%	14	62
V	sap e	燙了	30	23	37%	9	62

(11) Stimuli with roots ending in [t]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	ts ^h ut e	擦子	11	49	79%	2	62
N	mat e	襪子	11	47	76%	4	62
A	lat e	辣的	11	50	81%	1	62
A	fat e	寬的	6	56	90%	0	62
V	sit e	吃了	6	56	90%	0	62
V	fat e	發了	5	57	92%	0	62

¹⁸ See §6 for a discussion of the use of voiced consonant as the onset of particles.

¹⁹ The ‘Onset’ answers include voiced or voiceless variants of the expected answer. As explained in footnote 17, the liaison consonant is voiced, different from Luo’s (1988) report. This voiced variant of the stop (i.e., [b] and [g]), however, cannot occur syllable initially in the phonology of the language (except [l], which is the voiced variant of [t]). Thus when the particle is moved to the beginning of the two-syllable pair, some subjects retained the voiced quality of the consonant, while others regularize the consonant to be voiceless. Both these answers are expected and accepted as evidence showing that the subject considered there to be an initial consonant with the particle. All ‘Other’ answers have onset consonants other than the expected consonants at the beginning of the particle.

(12) Stimuli with roots ending in [k]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	vuk e	屋子	29	31	50%	2	62
N	tsok e	桌子	37	20	32%	5	62
A	p ^h ak e	白的	35	23	37%	4	62
A	suk e	熟的	32	28	45%	2	62
V	ts ^h ok e	對了	38	21	34%	3	62
V	suk e	熟了	34	21	34%	7	62

(13) Stimuli with roots ending in [m]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	tiam e	店	23	31	50%	8	62
N	lam e	籃子	16	37	60%	9	62
A	lim e	喝的	22	36	58%	4	62
A	ham e	鹹的	16	37	60%	9	62
V	hem e	喊了	18	41	66%	3	62
V	ts ^h im e	找了	11	47	76%	4	62

(14) Stimuli with roots ending in [ŋ]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kun e	棍子	11	48	77%	3	62
N	ten e	凳子	16	43	69%	3	62
A	son e	酸的	16	42	68%	4	62
A	ŋon e	軟的	16	36	58%	10	62
V	von e	換了	10	42	68%	10	62
V	son e	算了	9	47	76%	6	62

(15) Stimuli with roots ending in [ŋ]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	piaŋ e	餅乾	32	25	40%	5	62
N	t ^h oŋ e	糖果	23	38	61%	1	62
A	fuŋ e	紅的	29	30	48%	3	62
A	kuŋ e	公的	23	35	57%	4	62
V	kioŋ e	生了	23	36	58%	3	62
V	koŋ e	講了	25	34	55%	3	62

Examining these results, we find that the coda consonants in the roots affected the liaison behavior more than the types of particle. The liaison consonants [l] (resulting from [t])

and [n] were especially prone to be regarded as part of the particle. The liaison consonants [m] and [ŋ] also tended to be recognized as the onset of the particle. On the other hand, [b] (or [p]) and [g] (or [k]) were recognized less than 50% of the time. Compared with Taiwan Min whose speakers only recognized 14% of the onset in the particles, Miaoli Hakka subjects in general recognized 65% of the liaison onset. Even if we discount the ‘Other’ answers, the ‘Onset’ answers were still 58%.²⁰ This represents a striking difference between Taiwan Min speakers and Taiwan Hakka (Miaoli) speakers in their realization of basically the same phonological phenomenon.

5.1.2 Results from Zhudong subjects

Next we examine the results given by Zhudong subjects. The following tables follow the format of those in the previous section. However, only two types of particles are included in these tables, as the perfective marker in Zhudong Hakka is [le] rather than [e], and thus liaison consonants are not possible for this particle.

(16) Stimuli with roots ending in [p]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kiap ə	夾子	36	8	13%	18	62
N	hap ə	盒子	39	11	18%	12	62
A	kiap e	夾的	40	6	10%	16	62
A	sap e	燙的	41	11	18%	10	62

(17) Stimuli with roots ending in [t]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	ts ^h ut ə	擦子	29	24	39%	9	62
N	mat ə	襪子	24	26	42%	12	62
A	lat e	辣的	34	27	44%	1	62
A	fat e	寬的	31	29	47%	2	62

(18) Stimuli with roots ending in [k]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	ʒok ə	藥	52	6	10%	4	62
N	tsok ə	桌子	40	15	24%	7	62
A	p ^h ak e	白的	42	14	23%	6	62
A	ʃuk e	熟的	40	15	24%	7	62

²⁰ Wang & Kao (2004) did not report ‘other’ answers. In fact there were only three ‘other’ answers in the entire experiment.

(19) Stimuli with roots ending in [m]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	tiam ə	店	30	12	19%	20	62
N	lam ə	籃子	25	19	31%	18	62
A	kim e	金的	36	23	37%	3	62
A	ham e	鹹的	38	18	29%	6	62

(20) Stimuli with roots ending in [n]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kun ə	棍子	25	22	36%	15	62
N	ten ə	凳子	26	16	26%	20	62
A	son e	酸的	34	16	26%	12	62
A	ŋon e	軟的	22	19	31%	21	62

(21) Stimuli with roots ending in [ŋ]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kiaŋ ə	鏡子	30	16	25%	16	62
N	t ^h oŋ ə	糖果	33	21	34%	8	62
A	fuŋ e	紅的	42	16	25%	4	62
A	kuŋ e	公的	37	19	31%	6	62

It is quite clear that the Zhudong subjects did not give as many ‘Onset’ answers as the Miaoli subjects, as none of the ‘Onset’ answers took up more than 50% in the items. Again, the liaison consonant [l], resulting from [t], was recognized most frequently, although, unlike the Miaoli data, [n] did not fare better than other consonants. In this connection, the ‘Onset’ answers taken together accounted for 28% of the answers, and all answers with onset attached to the particles (‘Onset’ + ‘Other’) accounted for 45%. These numbers are clearly less than those by Miaoli subjects, but are more than those by Taiwan Min subjects.

5.1.3 Results from Meinong subjects

The third group of subjects we examine is from Meinong. As shown above, Meinong Hakka is a variant of Sixian, the same as Miaoli. The results are presented in the following tables. Since there were only 22 subjects in this group, the total number of answers to each item is 22.

(22) Stimuli with roots ending in [p]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kiap e	夾子	9	8	36%	5	22
N	iap e	葉子	9	8	36%	5	22
A	kiap e	夾的	9	6	27%	7	22
A	sap e	燙的	7	7	32%	8	22
V	kiap e	夾了	9	7	32%	6	22
V	lap e	繳了	8	7	32%	7	22

(23) Stimuli with roots ending in [t]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	ts ^h ut e	擦子	2	19	86%	1	22
N	mat e	襪子	2	18	82%	2	22
A	lat e	辣的	6	14	64%	2	22
A	fat e	寬的	4	18	82%	0	22
V	sit e	吃了	4	18	82%	0	22
V	fat e	發了	5	16	73%	1	22

(24) Stimuli with roots ending in [k]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	vuk e	屋子	11	9	41%	2	22
N	tsok e	桌子	11	9	41%	2	22
A	p ^h ak e	白的	11	10	45%	1	22
A	tsok e	穿的	9	12	55%	1	22
V	ts ^h ok e	對了	9	9	41%	4	22
V	suk e	熟了	11	8	36%	3	22

(25) Stimuli with roots ending in [m]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	tiam e	店	5	9	41%	8	22
N	kam e	橘子	6	8	36%	8	22
A	t ^h iam e	甜的	5	13	59%	4	22
A	ham e	鹹的	5	12	55%	5	22
V	lim e	喝了	5	14	64%	3	22
V	ɲiam e	唸了	6	11	50%	5	22

(26) Stimuli with roots ending in [n]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	kun e	棍子	5	12	55%	5	22
N	ten e	凳子	5	16	73%	1	22
A	son e	酸的	6	14	64%	2	22
A	tsin e	真的	5	15	68%	2	22
V	k ^h on e	看了	5	14	64%	3	22
V	ten e	等了	6	14	64%	2	22

(27) Stimuli with roots ending in [ŋ]

Cat.	Stimulus	Gloss	Zero-onset	Onset	%	Other	Total
N	piəŋ e	餅乾	8	12	55%	2	22
N	t ^h oŋ e	糖果	7	14	64%	1	22
A	naŋ e	冷的	7	15	68%	0	22
A	kuŋ e	公的	7	15	68%	0	22
V	kioŋ e	生了	6	14	64%	2	22
V	k ^h oŋ e	放了	8	13	59%	1	22

Similar to Miaoli, the liaison consonants [l] (resulting from [t]) and [n] were recognized frequently as the onset of the particles. But in Meinong, the liaison consonant [ŋ] was also very welcomed. Again, the ‘Onset’ answers took up 55%, and the answers with onset particles (‘Onset’ + ‘Other’) took up 69%.

6. Discussion

In the syllable inversion experiment, when the subjects were to move the particle to the front, they had to decide whether they would move the liaison consonant with the particle. We assume that if they move the consonant with the particle, they could do so only when they considered the consonant part of the particle. One possible objection to this assumption is that since voiced oral stops are not allowed in the syllable initial position in Taiwan Hakka (in fact they are not present in the Hakka phonemic inventory), they should not be present in the underlying representation. The fact that most of the liaison consonants that were moved with the particles were of this type shows that the sound is phonetic and not phonological, hence the liaison consonant could not have been morphologized. Our interpretation of this behavior is that the phonetic fact is that when the particle was moved to be at the first syllable, it was very clear that it had an onset. Remember that, in Taiwan Min, very few particles (only 14%) were moved with an onset. The voiced oral stops which were typical of liaison consonants are allowed in Taiwan

Min. Given this fact, the Taiwan Min subjects still gave few particles with onset. Thus when Hakka subjects moved particles with onset, the act itself was significant.²¹ Whether these voiced oral stops will become phonological is something we need to look into further. Admittedly the morphologization process is by no means complete, as the most advanced performance by Miaoli subjects was only close to 70%. We may imagine that when the consonants are completely morphologized, one of two things may happen. The first is that these consonants may be devoiced, as depicted by Luo (1988). This would ‘regularize’ the consonants, and the phonology of the language remains unchanged. The second possibility is that they remain voiced; in that case the phonology of the language will become different. These possibilities in historical change need to be confirmed.

The results as shown above indicated a clear distinction between Taiwan Hakka and Taiwan Min, and also between the Sixian and Hailu varieties. We can represent the varying degrees of morphologization along a continuum:

(28) Degrees of morphologization

least morphologized	most morphologized	
Taiwan Min	Taiwan Hakka (Hailu)	Taiwan Hakka (Sixian)
14%	Zhudong 28%/45%	Miaoli 58%/65%
		Meinong 55%/69%

This continuum shows the gradient nature of the phenomenon. The gradient nature manifests itself not just in different languages, but also in different sounds involved. In our estimation, the [l] sound is the fastest to be morphologized. The [l] items contributed more than one third of the ‘with onset’ answers in Taiwan Min (Wang & Kao 2004:830), almost a quarter (24%) of the ‘Onset’ answers in Miaoli and Meinong Hakka, and more than a quarter (26%) of the ‘Onset’ answers in Zhudong Hakka. Of the ‘Other’ responses, [l] took up 38% in Miaoli, 14% in Zhudong, and 31% in Meinong. Thus it is fair to say that [l] is a preferred liaison consonant in both Taiwan Min and Taiwan Hakka. The nasal consonants [m, n, ŋ] were also quite readily accepted as the onset of the particles in Taiwan Hakka.

The continuum shows the difference between Sixian and Hailu varieties. The percentages presented in Miaoli and Meinong data look rather comparable, which shows that the two Sixian Hakka varieties did not differ much, despite their geographical separation.

²¹ A native speaker of Hakka, on hearing the report of the experiment, said to the first author that the results were quite intuitive, as he had thought that the liaison consonants were a natural part of the particle.

7. Conclusion

The possibility of the liaison consonants being morphologized has largely escaped linguists' attention. However the authors believe that such morphologization may be the precursor to language change, just as in the case of *nickname* in English. The reason it has been neglected is probably because the environments of the liaison rule have not been altered yet in language use: the [la] of [ts^had la] 'thief' in Taiwan Min still follows the [t/d] in the previous syllable, and the [ne] of [kun ne] 'stick' in Taiwan Hakka still follows the [n] in the previous syllable. The rules set up by linguists are still able to "explain" such phenomena. This is not unlike the case of phonologization discussed in Hyman (1975: 171-173), where the lengthened vowels before voiced consonants are observed to be much longer in English than in other languages such as Russian or Norwegian. The fact that the lengthened vowels still occur before voiced consonants makes it possible to capture the phenomenon in a linguistic rule. But a reasonable expectation is that the lengthened vowel has become phonological in due course, and if the environment changes (e.g. the post-vocalic consonant becomes voiceless), the vowel will stay long. Similarly, when the liaison consonants have become morphologized, we may expect that even if the environment changes, the liaison consonant will remain. This in fact has happened to some items. Wang & Kao (2004:831fn) mention a case in which a subject reversed [tsit le] 'one' as [le tsi], without the [t] in the coda position of the root syllable. In many young people's speech nowadays, some "entering tone" syllables have lost the coda consonants. Obviously this particular subject was a case in point. But he/she was still able to produce the particle [le], indicating that he/she had regarded [le] to be an item by itself. Although this is just one case, it is very significant in the meaning it represents.

It is our contention that "rules" as a means of capturing linguistic generalizations should not be taken at face value. Phenomena such as morphologization and phonologization should be considered seriously in order to understand the course of language change more meaningfully.

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台閩語與台客語連音的構詞化

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連音起於音節尾子音傳到以母音為首的詞綴音節。本研究探討台閩語與台客語使用者如何認知此連音。台閩語的觀念形成實驗及音節對調實驗結果採自 Wang & Kao (2004)，我們另外對台客語苗栗、竹東、美濃方言做了音節對調實驗。結果顯示不同程度的構詞化現象。台閩語受試者傾向認為詞綴不帶子音，台客語則有顯著多數認為詞綴帶子音。而台客語中苗栗、美濃（四縣腔）又顯著的多於竹東（海陸腔）。我們認為這些不同程度的反應表現不同語言裡不同程度的構詞化現象。

關鍵詞：連音，台閩語，台客語，構詞化，音節調換實驗