

The Social Implications of Syllable-Final Nasal Mergers in Taiwan Mandarin: A Variation Study*

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This study quantitatively examines the variation of (ing) and (eng) in Taiwan, drawing data from sociolinguistic interviews with subjects from Taipei and Tainan. It argues that, first, the two should be treated as two separate variables rather than one with two phonological conditions, and second, language external factors, including speaker's place of origin, gender, current residence, and topic all influence the two variables, but to different extents. Place of origin has the strongest effect on the variation of (ing) and (eng), but the use of the merger variants of the two variables is respectively led by southerners and northerners, indicating a dialectal split. The merger variant [in] of (ing) is especially closely associated with regional identity. Gender also plays a substantial role in the variation of (ing), with males using the merger variant [in] significantly more than female subjects. In contrast, the relation between gender and (eng) appears more opaque, with Taipei females leading in the use of [ən] and Tainan females using it least frequently among the 2 x 2 dyads of gender and region. The seemingly irregular pattern with regard to gender can be explained in light of Fon et al.'s (2011) perception test results and sociolinguistic literature related to gender and language variation. The study further provides a sketch of the development of the social meanings of the two variables in light of the findings of this study.

Key words: sociolinguistic variation, regional difference, gender, syllable-final nasal mergers, social meaning

1. Introduction

This study examines the social factors that correlate with the variation of syllable-final nasal /ŋ/ in Taiwan Mandarin, hereafter noted as (ng), following the convention of variationist sociolinguistic studies. Mandarin Chinese has two syllable-final nasals, /n/

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and /ŋ/. Previous studies have reported that there is a tendency for the two nasals to merge when preceded by either of two vowels, /i/ or /ə/. As early as 1985, Kubler observed the replacement of /iŋ/ and /əŋ/ by [in] and [ən] in Taiwan Mandarin and attributed the nasal merger to the influence of Southern Min on Mandarin in Taiwan. Later studies in the 1990s, such as Chen (1991) and Tse (1992), further explore the nasal merger with elicited experimental data, but do not reach a consensus on the merger direction. While Tse confirms Kubler's (1985) observation of the /ŋ/ to [n] merger, Chen, in contrast, notes an opposite merger direction, /n/ to [ŋ], when the nasal is preceded by the vowel /i/. The contradictory results have prompted another wave of explorations on the nasal merger in recent years (e.g. Hsu & Tse 2007, C. Hung 2005, J. Hung 2007, Lai 2009, Yang 2010, and Fon, Hung, Huang & Hsu 2011), each with its own methodology and central concern. However, there remain incongruent results in terms of the direction of the mergers and the merging rates. The lack of a unanimous result is not surprising, however, if we consider the linguistic and sociolinguistic complexity associated with these nasal mergers. As J. Hung and Fon et al. point out, the contradictory results are likely to be caused by dialectal and methodological differences, as different subgroups of the Taiwanese population are observed in different studies and the data examined are obtained through different ways. In other words, the phenomenon of nasal mergers is probably far more complex than any of the single aforementioned studies depicts; a holistic understanding requires further investigation and attention to different aspects of the merger phenomenon.

This study seeks to contribute to our understanding of nasal mergers from a variationist sociolinguistic perspective. Shifting the focus away from the debate on the direction of the mergers, this study examines the social and contextual factors influencing the variation of (ng), using data from 35 sociolinguistic interviews among college students in Taipei and Tainan. Specifically, this study quantitatively investigates to what extent the variation of (ng) is influenced by both language internal (i.e. preceding vowels) and external factors (i.e. gender, regional background, current residence, and topic/level of formality). By delimiting the scope of the analysis to college students and to (ng) variation (or /ŋ/ to [n] merger in previous works) alone, yet using an abundance of data including more than 800 minutes of recorded speech and 1,104 valid tokens of the syllable-final velar nasal variable (ng), this study hopes to provide an in-depth understanding of the various social and contextual factors at work in the variation of (ng) and to explore the symbolic meanings attached to the variants in question.

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While sharing a common interest with the aforementioned studies in syllable-final nasals in Taiwan Mandarin, this study differs from others in several crucial aspects: first, unlike the majority of previous works, which concentrate on the role of the nasals in language contact and change, this study focuses more on the social distribution and implications of the (ng) variation and interprets the findings in light of previous theorizing of gender, region, and style in sociolinguistics. The incorporation of the social dimension may bring us additional insights and contribute to a well-rounded understanding of the nasals in question. The second difference is mainly methodological: this study observes variation of (ng) through natural occurrences of (ng) tokens in semi-formal interviews where no attempt was made to elicit the target variable. Although interview speech is still categorized as ‘formal speech’ in Labov’s (1966) operationalization of linguistic styles, it is, nevertheless, closer to natural speech than the reading of sentences or single lexical items, methodologies adopted in previous studies, especially when the interviews are semi-formal and allow interviewees to venture into the related topics at their own pace and choice of sequence.

The research questions of this study are as follows:

- (1) Do language external factors, including speaker’s place of origin, gender, current residence, and/or topic, influence the pattern of the variation of (ng)?
- (2) Do preceding vowels (/i/ or /ə/) influence the pattern of the variation of (ng)? Methodologically, should /iŋ/ and /əŋ/ be treated as one variable (ng) with two conditions on the preceding vowel, or as two separate variables (hereafter (ing) and (eng), respectively)?
- (3) Do the factors identified above interact with each other?
- (4) What are the social, theoretical, and methodological implications of the findings?

Below I review general trends in variation studies, followed by a review of those studies concerned with syllable-final nasal mergers. Research design of the study, quantitative results, and discussion sections will then be presented.

2. Literature review

2.1 Variation study

The study of variation originates from a simple observation—speakers do not always say the same thing in the same way. In 1963, William Labov carried out the first quantitative community study of variation about the pronunciation of /ay/ in Martha’s Vineyard and observed that the unique centralized realization, [əy], was used most frequently by speakers with a strong island identity. His subsequent works (Labov 1966,

1972a, 1972b) about New York City further laid the foundation of variation study. Labov identifies a regular connection between speakers' socio-economic statuses and patterns of language variation, with the higher socio-economic status correlating with greater use of the standard or prestige variant. Labov's monumental work, along with similar survey studies exploring the distribution of variables across large urban populations, such as Wolfram (1969), Trudgill (1974), and Macaulay (1977), provides us the big picture of linguistic variability and major demographic categories (such as class, gender, ethnicity, age, education level, and so forth). Such works are termed 'the first wave of variation studies' by Penelope Eckert (forthcoming).

In addition to inter-speaker variation, Labov (1966) also explores the relationship between inter- and intra-speaker variations, the latter also termed stylistic variation. He operationalizes stylistic variation as the amount of attention paid to speech, with the assumption that a vernacular, non-standard language is a speaker's most natural linguistic production free of conscious monitoring and that standard language requires the most attention. Central in Labov's view of stylistic variation are the co-variation of the three following continua:

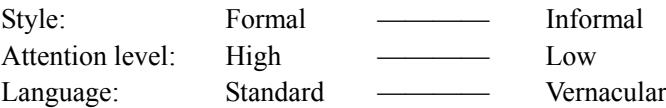


Figure 1: Three continua in Labov's view of stylistic variation

Labov's operationalization of stylistic variation has been replicated in many studies afterwards, but has also been challenged (e.g. Bell 1984, Eckert & Rickford 2001) for its lack of concern with speaker agency and the interactional or identity-related dimension of language.

While the first wave of variation studies are mainly concerned with co-variation between linguistic variables and social categories (mostly pre-determined by the researchers) across large urban populations, some subsequent variation studies, or 'the second wave of variation studies' in Eckert's terms, incorporate ethnography and explore the correlation between language variation and locally meaningful social distinctions in smaller communities. Cheshire (1978) examines morpho-syntactic variation among three groups of adolescent boys and girls in Reading, England and concludes that variation in boys' and girls' speech are both influenced by the vernacular culture, but are transmitted in different ways. Milroy's (1980) ethnographic study on three working-class communities in Belfast, Ireland establishes a connection between one's social network (specifically, the density and multiplicity of one's ties with the local community) with language variation. Rickford's (1986) study on a sugar plantation in Guyana uncovers a

sharp distinction in terms of language variation and language ideology between those who work and live on the plantation (the Estate class) and those who work and live off the plantation (the Non-Estate class). Unlike the aforementioned survey studies of the first wave, studies of this category do not stop at the finding of correlation between language and demographic factors, but seek to explore the local categories and configurations that give rise to the social distribution of variation.

As variation studies become increasingly involved with the connection between language variation and locally meaningful categories, researchers such as Penelope Eckert and her associates (e.g. Eckert 2000, 2008, Campbell-Kibler 2007, Podesva 2007, Zhang 2005, 2008) take it a step further and place the social meanings of variables at the heart of their research. Eckert (2000) finds that differential use of variation is one of the means that enables groups of high school students in Detroit to constitute different lifestyles and distinguish themselves from other groups. Eckert (2008) further argues that there is not a one-to-one mapping between a variable and a precise meaning or identity. Instead, variation constitutes an indexical system in which general meanings can become specific in the situated use of a variable. Variation, thus, is seen more as a resource for speakers to use to project a persona in the moment-to-moment interaction than as a pure reflection of speaker membership in a given community.

2.2 Nasal mergers in Taiwan Mandarin

The two nasals in question, /n/ and /ŋ/, can both occur with the five vowels in the Mandarin Chinese system, /i/, /ə/, /a/, /u/, and /y/. But the neutralization of the nasals does not generally occur when they are preceded by /a/, /u/, or /y/ (Yueh 1992, Hsu & Tse 2007, Fon et al. 2011). Thus the following review focuses on /n/ and /ŋ/ preceded by /i/ and /ə/. The /ŋ/ to [n] merger in Taiwan has been observed since the 1980s. Kubler (1985), based on linguistic data collected in the 1970s, reports that the /n/ and /ŋ/ distinction is often not maintained, with /iŋ/ and /əŋ/ frequently replaced by [in] and [ən]. He attributes the mergers to the influence from Southern Min, specifically, the non-existence of /iŋ/ and /əŋ/ in Southern Min. Ing (1985) also observes the merger between /iŋ/, /in/ and /əŋ/, /ən/, but instead argues that, in terms of /iŋ/ and /in/, the major trend is from /in/ to [iŋ], although instances of the opposite trend (/iŋ/ to [in]) can also be found. Chen (1991) notes two trends among speakers from Taipei: /in/ to [iŋ] and /əŋ/ to [ən]. Different from the two previous studies, which merely state their observations, Chen provides quantitative results from 60 participants: it is shown that the /in/ to [iŋ] merger occurs about 73% of the time and the /əŋ/ to [ən] merger occurs about 46% of the time.

Unlike these early studies that are mainly concerned with a comprehensive description of Taiwan Mandarin in which the nasal merger is but one among many

features under examination, Tse (1992) and Yueh (1992) report specifically on the nasal mergers. Tse's experimental study investigates both the production and perception of the final nasals and indicates that /ŋ/ to [n] is the leading merger while the opposite direction, /n/ to [ŋ], was present but less frequent. Yueh also explores both the production and perception aspects of the syllable-final nasals, but as a sociolinguistic study, she examines not only language-internal factors (i.e. phonological environment) but also social factors (i.e. gender, age, education level, level of formality, and residential mobility) that may account for the /ŋ/ and /n/ variation. The results indicate that final nasals preceded by /i/ and /ə/ are more likely to merge than nasals preceded by /u/ and /a/. Social factors (except education level) do not generally have a significant effect on the production aspect of the nasal merger, but show statistically significant differences in the perception of the nasals.

The above studies generally agree that nasals preceded by /i/ and /ə/ are more frequently subject to change, while the distinction between /aŋ/ and /an/ remains stable. There is a lack of consensus, however, about the direction in which the variation moves (/ŋ/ to [n] or /n/ to [ŋ]) and which vowel (/i/ or /ə/) is leading the change. The lack of unanimous results in early studies has prompted a new wave of explorations in recent years. C. Hung's (2005) sociolinguistic study investigates the variation of velar nasal /ŋ/ in Kaoshiung. Focusing only on the velar nasal (rather than on variation in both directions), she examines whether social factors such as gender, age, social class, ethnicity, and context (level of formality) have an impact on the variation of (ng). The results indicate that age, social class, and context do have a significant influence on the variation of (ng). Another study that takes social factors into consideration is Hsu & Tse's (2007) study, which acoustically examines both /ŋ/ to [n] and /n/ to [ŋ] mergers and their relations with vowel type ([i], [ə], and [a]), gender, generation (age), and ethnicity. The results, however, indicate that none of the social factors have a statistically significant effect on the occurrence of [ŋ] and [n]. Instead, the significant effects are all language related: merger type, preceding vowel, and the interaction between the two. Lai (2009) and Yang (2010) further explore the acoustic characteristics of the nasal mergers in Taiwan, contrasting the mergers in Taiwan Mandarin with those of Mandarin speakers from other places. Yang further argues that Taiwan Mandarin and Mainland Mandarin are subject to different trends, with /ŋ/ to [n] leading in Taiwan and /n/ to [ŋ] leading in China.

These results still do not resolve the different (and sometimes contradictory) findings of different studies, especially in terms of whether /ŋ/ to [n] or /n/ to [ŋ] is the leading trend and whether (and which) social factors indeed play a role. J. Hung (2007) suggests that these differences might result from dialectal and methodological differences between studies: "...it is possible that both rules [i.e. /ŋ/ to [n] and /n/ to [ŋ]] are robust in

Taiwan Mandarin... and the above discrepancy is mainly a reflection of this phenomenon through observations of different subgroups in the population” (p.8). In a similar vein, the different results about the significance of social factors may also be due to dialectal and methodological differences.

J. Hung’s (2007) suggestion is further explored in Fon et al.’s (2011) study on dialectal variations of syllable-final nasal mergers. Using experimental data, Fon et al. report a dialectal split in the nasal mergers between northern and southern Taiwan Mandarin. Among the three mergers identified (i.e. /əŋ/ to [ən], /in/ to [iŋ], and /iŋ/ to [in]), all are found in southern Taiwan Mandarin, but only the former two are observed in northern Taiwan Mandarin in their data. Northerners also lead in these two mergers, while southerners lead in the /iŋ/ to [in] merger. Fon et al. further discuss the possible causes of the mergers and argue that the former two are innovations while the latter is due to negative transfer from Min. Perceptions toward the mergers also differ, with /iŋ/ to [in] most stigmatized, /əŋ/ to [ən] with a slight negative tang, and /in/ to [iŋ] deemed most positive.

The 2011 study by Fon et al. provides the first systematic outline of dialectal differences on syllable-final nasal mergers in Taiwan. Building on their findings, the current study further explores dialectal and social variation of the syllable-final nasals and their social implications.

2.3 Social and contextual factors examined in previous studies

Though there have been quite a few studies exploring nasal mergers in Taiwan Mandarin, only some of them take social and contextual factors into consideration. As mentioned above, Yueh (1992) and C. Hung (2005) are two studies specifically about the sociolinguistics of the nasal mergers. The former examines gender, age, education, level of formality, and residential mobility, while the latter investigates age, social class, ethnicity, and context (i.e. level of formality in Yueh’s terms). Tse (1992) does not consider social factors, but elicits the target nasals under two contextual conditions: in isolation and in longer constructions. Such a design is roughly equivalent to Yueh’s ‘level of formality’ and C. Hung’s ‘context.’ Hsu & Tse (2007) include gender, generation, and ethnicity in their design, but none of these social factors show statistical significance. Fon et al. (2011) consider place of origin, gender, and condition (character reading or sentence reading). While place of origin (dialect) has shown the most salient statistical significance, condition (or context) has also been shown to have significant influence on some of the mergers in question. Gender itself is not found to have a statistically significant effect on the mergers examined in Fon et al.’s study, but the interaction between gender and dialect is shown to be significant in some of the

mergers.¹ Below in Table 1, I summarize the social and contextual factors examined in these studies (indicated by a check), along with information about statistical significance (indicated by an asterisk). Only the production aspect of the data is reported in the table.

Table 1: Social and contextual factors examined in previous studies

	Yueh (1992)	C. Hung (2005)	Hsu & Tse (2007)	Fon et al. (2011)	Tse (1992)
Gender	√	√	√	√(*)	
Age (generation)	√	√*	√		
Education	√*				
Social class (education and occupation)		√*			
Ethnicity	√	√	√		
Residence	√				
Context (level of formality, condition)	√*	√*		√*	√*
Place of origin				√*	

As the summary table has shown, context/condition is the only factor that has been shown to have a consistent statistical effect on the variation of (ng) across different studies. The second most widely examined factor has been gender, but the results are almost unanimous that it is insignificant. However, as I argue in later discussion of this paper, gender, in fact, shows a consistent impact on variation of (ng) when regional difference is taken into consideration.

3. Methodology

This study explores the variation of (ng) using GoldVarb X (Sankoff et al. 2005), the latest version of the variable rule program and a key methodological tool of variationist sociolinguistics. The data used in this study were collected in sociolinguistic fieldwork conducted between 2002 and 2004 at two university campuses, National Taiwan University in Taipei and National Cheng Kung University in Tainan. In both universities, I interviewed students from the respective Tainan Student Associations and the Chien-Pei Alumni Associations. The former consists of students from Tainan City and County and the latter of alumni of Taipei Municipal Chien-Kuo Senior High School and Taipei

¹ Thus, in Table 1, statistical significance of the gender factor is presented with parentheses.

Municipal First Girls' High School. Such a research design yields four groups of interviewees: Students from Taipei who were studying in Taipei (abbreviated as Taipei students in Taipei), students from Tainan who were studying in Taipei (Tainan students in Taipei), students from Taipei who were studying in Tainan (Taipei students in Tainan), and students from Tainan who were studying in Tainan (Tainan students in Tainan). Each group contains both male and female students. The number of interviewees in each group is illustrated in Table 2 below.

Table 2: Number of interviewees by place of origin, school, and gender

Place of origin School (current residence)	Taipei	Tainan	Total
NTU (Taipei)	7 (4m/3f)	9 (4m/5f)	16 (8m/8f)
NCKU (Tainan)	9 (4m/5f)	10 (5m/5f)	19 (9m/10f)
Total	16 (8m/8f)	19 (9m/10f)	35 (17m/18f)

Note: M refers to male and F refers to female.

In addition to gender and place of origin, the more commonly examined factors in socio-linguistic studies, this study also includes current residence as a factor. In other words, the study seeks to explore whether staying or leaving one's hometown results in more heightened regional awareness and whether the interviewees' language use is influenced in this regard.

The 35 semi-structured interviews ranged from 45 minutes to about 3 hours and were composed of roughly seven parts, of which only three parts (uniqueness of their hometown, practice and observation of general language use, and language and politics in Taiwan) have been used in the current study. The length of interviews varied greatly because the interviewees were encouraged to express their opinions as much as possible. The interviewees were also familiar with me, the interviewer, since I had been participating in the activities of the student associations prior to the interviews. The familiarity may have reduced the level of formality commonly associated with formal interviews.

As mentioned earlier, the current study has not used the full length of the interviews. Instead, in each interview recording, about 8 minutes of the interviewee's contribution (excluding questions and feedbacks from the interviewer) were excerpted from each of the three topics mentioned above, which resulted in about 25 minutes of speech sample from each interviewee. Each token of (ng) variable was then identified. I then chose to focus on only the (ng) variable preceded by /i/ and /ə/, since previous studies (e.g. Yueh 1992, Hsu & Tse 2007) have indicated that (ng) preceded by /a/ and /u/ behave rather differently and do not merge with [n] in general. After all of the targeted tokens were identified, they were then coded by their phonetic realizations (e.g. whether pronounced

as [n] or [ŋ]), as well as speaker's gender, place of origin, school (current residence), the interview section where the token occurred, and the token's preceding vowel. The coding of phonetic realization is based on the auditory perception of three trained research assistants who worked independently and then double-checked each other's coding. Problematic ones were then disregarded. Altogether, 1,104 valid tokens were coded, and 5 independent variables with 11 factors (Tagliamonte 2006) were considered (see Table 3 below).²

Table 3: Independent variables and factors considered in this study

Gender	Male
	Female
Place of origin	Taipei
	Tainan
School (current residence)	NTU (Taipei)
	NCKU (Tainan)
Interview section	Hometown
	General language use
	Language and politics
Preceding phonological environment	/i/
	/ə/

The coded data were then run through GoldVarb X. Significant factor groups were then identified through binominal step-up/step-down analysis.

After analyzing the overall pattern, I further ran two separate analyses of (ing) tokens and (eng) tokens to explore whether the two pattern similarly or differently. The results are presented in the following section.

4. Results

4.1 General distributions of all (ng) tokens

Overall, when both (ing) tokens and (eng) tokens are considered, the [ŋ] variant occurs 63.6% of the time while the [n] variant (the merger variant) occurs 36.4% of the time.

² Different categories within a variable are termed 'levels' in general statistics. But here I follow Tagliamonte's (2006) guidebook to the analysis of sociolinguistic variation and use 'factors' instead.

Table 4: Overall distribution of the realization of tokens of (ng)

Velar		Alveolar	
%	N	%	N
63.6	702	36.4	402
Total N		1104	

Below I show the distribution of the merger variant by each factor group one by one, followed by the results of multivariate analysis.

Gender

In terms of gender, male interviewees show a greater frequency (41%, also reported in the percentage column of Table 5 below) than females (32%) to merge the nasals. Previous works in variationist sociolinguistics (e.g. Trudgill 1972, 1974, Macaulay 1977, Eisikovits 1998) often point out that female speakers tend to use forms associated with overt prestige more frequently. They are usually relatively conservative when the variant in question is stigmatized, but they could also be innovators leading a change when the variant in question does not carry a salient negative social connotation (cf. Labov 1972b). Along this line, the more frequent use of the merger variant by males in the current study may indicate that the [ŋ] realization, which has been the textbook pronunciation, is still associated with overt prestige and standardness, while the [n] variant may carry a more or less negative interpretation.

Place of origin

Students from Tainan show a stronger tendency (40%) to merge the nasals than students from Taipei (31%). This result indicates that region is an important factor in understanding (ng) merger in Taiwan. Further exploration of (ing) and (eng) in relation to region is discussed later in this paper.

School (current residence)

Overall, current residence seems to have little effect on the nasal merger. The difference between the NTU and NCKU groups is hardly observable (37% vs. 36%).

Topic

I originally hypothesized that interviewees would be more casual (and thus use more alveolar variant [n]) on the topic of their hometown, and would have a more formal speech style when making comments on language use in general and political language. The hypothesis was not born out, as Table 5 below shows. Yet another pattern can be observed: The later topics coincide with more use of the merger variant (34%, 36%, and

40% respectively). That is, as the interviews proceeded, the interviewees merge the nasals more frequently. A possible explanation is that speakers become more relaxed and less formal as interviews proceed. More discussion is provided later in the paper.

Preceding vowel

The (ng) variable is realized as [ŋ] slightly more frequently when the preceding vowel is [i] (39%) than when the vowel is [ə] (34%). The result is surprising, since several works on (ng) merger in Taiwan Mandarin, such as Hsu & Tse (2007) and Fon et al. (2011), have argued that (eng) merger is more common than (ing) merger. The difference may be due in part to different methodology, a consideration which is explored later in this study. Yet, although the result here shows some contradiction, the difference between the percentages of (ing) merger and (eng) merger is not large in this study.

4.2 Results of multivariate analysis

A binomial step-up/step-down analysis was performed using GoldVarb X. It is a step-wise procedure of multiple regression embedded in the variable program that seeks to find the groups which make the most significant change to the model when they are added or subtracted from the rest (Tagliamonte 2006). In the current study, among the five factors considered, three are identified as significant at the .05 level: (1) place of origin, (2) gender, and (3) preceding vowel, ranked by their relative strength (indicated by range of factor weights in Table 5). Results are summarized in Table 5 below. A factor weight is a numerical indication of the influence that each factor has on the presence of the variant in question, or in Tagliamonte's terms, "values assigned by the variable rule program indicating the probability of rule application" (p.264). Factor weights range between 0 and 1. A factor weight close to 1 is interpreted as favoring the application value, that is, the merger variant in this case.

Table 5: Multivariate analyses of the contribution of factors selected as significant to the probability of nasal merger (ng)

Corrected mean				.40
Log likelihood				-710.823
Total N				1104
		Factor weight	%	N
Place of origin				
	Tainan	.55	40	673
	Taipei	.43	31	431
	<i>range</i>	<i>12</i>		
Gender				
	male	.56	41	554
	female	.45	32	550
	<i>range</i>	<i>11</i>		
Preceding vowel				
	/i/	.54	39	485
	/ə/	.47	34	619
	<i>range</i>	<i>7</i>		
Topic				
	5. Language & politics	[.54]	40	383
	4. Language use	[.49]	36	373
	3. Hometown	[.47]	34	348
School (current residence)				
	NTU (Taipei)	[.50]	37	437
	NCKU (Tainan)	[.50]	36	667

Note: Factor groups not selected as significant are shown in square brackets.

4.3 Comparison of (ing) and (eng)

So far, all (ng) tokens have been treated as similar. Yet a question remains: Does the trend observed in the overall distribution of (ng) also exist in both the (ing) and (eng) tokens? Or instead, are there interactions which cannot be detected in the analysis of the overall pattern? This question also has methodological implications, in that it helps us to decide whether to treat (ng) as one variable with several conditions in its preceding phonological environment or to regard (ing) and (eng) as two separate variables. Thus, after the analysis of the overall pattern, separate analyses of (ing) and (eng) tokens are carried out to explore their similarities and differences. Results of two separate multivariate analyses indicate that (1) place of origin and (2) gender show statistically

significant influence on the (ing) merger (see Table 6), ranked again by their relative strength, while (1) place of origin and (2) topic show statistically significant effect on the (eng) merger at the .05 level (see Table 7). Place of origin and gender strongly influence the variation of (ing), as the ranges of factor weights are rather high at 41 and 25, respectively. In contrast, though place of origin and topic show statistically significant effect on the variation of (eng), their strength is relatively mild, as the ranges of factor weights are 12 in both cases. Below I discuss the four social factors—gender, place of origin, current residence, and topic—one by one in relation to both (ing) and (eng).

Table 6: Multivariate analyses of the contribution of factors selected as significant to the probability of nasal merger (ing)

Corrected mean				.39
Log likelihood				-324.720
Total N				485
		Factor weight	%	N
Place of origin				
	Tainan	.69	55	261
	Taipei	.28	21	224
	<i>range</i>	<i>41</i>		
Gender				
	male	.63	49	234
	female	.38	30	251
	<i>range</i>	<i>25</i>		
Topic				
	3. Hometown	[.55]	44	139
	4. Language use	[.43]	33	178
	5. Language & politics	[.53]	42	168
School (current residence)				
	NCKU (Tainan)	[.55]	44	273
	NTU (Taipei)	[.43]	33	212

Note: Factor groups not selected as significant are shown in square brackets.

Table 7: Multivariate analyses of the contribution of factors selected as significant to the probability of nasal merger (eng)

Corrected mean				.34
Log likelihood				-397.814
Total N				619
		Factor weight	%	N
Place of origin				
	Taipei	.58	42	207
	Tainan	.46	30	412
	<i>range</i>	<i>12</i>		
Topic				
	5. Language & politics	.54	38	215
	4. Language use	.54	39	195
	3. Hometown	.42	27	209
	<i>range</i>	<i>12</i>		
Gender				
	male	[.51]	35	320
	female	[.49]	33	299
School (current residence)				
	NTU (Taipei)	[.57]	40	225
	NCKU (Tainan)	[.46]	31	394

Note: Factor groups not selected as significant are shown in square brackets.

Gender

Table 8 shows that both (ing) and (eng) mergers are led by male speakers, but there is a major difference: gender difference is highly salient and statistically significant for (ing), but, in contrast, the difference is quite small for (eng). The distinction between (ing) and (eng) implies that the two may be linked to standardness or masculinity/femininity to different extents. Further implications of the results are discussed later in the paper.

Table 8: Percentage of merger variants of (ing) and (eng) by gender

	(ing)*	(eng)
Male	49	35
Female	30	33

Note: An asterisk indicates a statistically significant difference. Leaders in the use of the merger variants are in bold.

Place of origin

In both cases of (ing) and (eng), place of origin is a significant factor, yet, interestingly, the groups leading the mergers are the opposite. Tainan speakers lead in the (ing) merger, while Taipei speakers lead in the (eng) merger. Regional difference is particularly salient in the case of (ing), where a thirty five percent difference can be observed. The result generally corresponds to Fon et al.'s (2011) finding that northerners and southerners are involved in the two mergers to different extent and confirms that dialectal difference is a crucial factor in understanding the variation of (ng), although there are differences in details (such as frequency of the mergers), which are further discussed later.

Table 9: Percentage of merger variants of (ing) and (eng) by place of origin

	(ing)*	(eng)*
Tainan	55	30
Taipei	21	42

School (current residence)

The difference between students in the two cities does not reach statistical significance in either case, but the percentages in Table 10 below show a similar pattern with those in Table 9. It appears that regional variation has an effect not only on students from the respective regions, but also students who currently reside in the regions. In other words, while Tainan students show a stronger tendency to use the merger variant of (ing), students studying in Tainan, regardless of their origin, also have a stronger tendency to do so. The reverse is also true: While Taipei students merge (eng) more frequently, students currently studying in Taipei also do so more frequently than their counterparts. A major implication of the parallel between Table 9 and Table 10 is the effect of relocation on one's language variation and the flexibility and plasticity of one's linguistic behavior. I further discuss the implication of this finding later.

Table 10: Percentage of merger variants of (ing) and (eng) by school (current residence)

	(ing)	(eng)
NCKU (Tainan)	44	31
NTU (Taipei)	33	40

Topic

The variation of (ing) and (eng) also shows quite distinctive patterns in relation to topic. As shown in Table 11, topic shows a statistically significant effect on the variation of (eng); the percentages suggest an increase in the merger variant on later topics. In contrast, topic does not have a significant effect on (ing) and the percentages show a different

pattern: there is a sudden drop in frequency of the merger variant [in] between the two consecutive topics of hometown and general language use, followed by an increase between the two later topics. To further explore the possible cause of this discrepancy, I examined whether subjects from Tainan and Taipei showed any difference in this regard, especially in light of the regional difference identified previously in this study. Table 12 reveals a very interesting pattern: While (eng) among all subjects and (ing) among Taipei subjects tend to slightly or moderately increase the use of the merger variants as interviews proceed, (ing) among Tainan subjects shows a drastically different pattern—a very high percentage of merger variants on the topic of the uniqueness of their hometown, followed by a drop of 14% on the next topic, a difference that shows statistical significance. Such a unique pattern seems to indicate that the merger variant of (ing) is connected to regional identity among Tainan subjects, which also parallels my previous discussion that Tainan subjects play a leading role in the (ing) merger.

Table 11: Percentage of merger variants of (ing) and (eng) by topic

	(ing)	(eng)*
Hometown	44	27
Language use	33	39
Language & politics	42	38

Table 12: Percentage of merger variants of (ing) and (eng) by topic and subject's regional background

	(ing)		(eng)	
	Tainan	Taipei	Tainan	Taipei
Hometown	61	17	25	31
Language use	47	21	30	49
Language & politics	57	23	36	42

The results presented above indicate that (ing) and (eng) have distinctive patterns of variation. Below I discuss the implications of the findings above.

5. Discussion

5.1 The social implications of (ing) and (eng)

The results shown above indicate that the place of origin is the most salient social factor influencing the variation of (ng). Fon et al. (2011) argue that dialectal difference might be a major cause of inconsistent results in terms of syllable-final nasal mergers in

the literature. Using experimental data, they point out that northerners and southerners are involved with the (ing) and (eng) mergers in different ways, with southerners leading in the (ing) merger and northerners leading in the (eng) merger. The interview data in this study are generally consistent with Fon et al.'s finding of dialectal difference with statistically significant results in both cases (as shown in Table 9), yet incongruence still exists. Fon et al. argue that the (eng) merger exists in both the north and the south, with northerners leading the merger, while the (ing) merger is observed in the south but is almost non-existent in the north. In addition, the (ing) merger is rather infrequent in data from Fon et al., with only 25 instances of the [in] variant. In contrast, data in this study show that Taipei subjects do indeed use the merger variant [in] sometimes (20.5 %), and thus the result contradicts Fon et al.'s finding of near non-existence. But there is a major difference (about 35%) between Taipei subjects and Tainan subjects, indicating that the robustness of the merger differs significantly in the two places. Furthermore, the occurrence of merger variant [in] is much more frequent in the current study, with 190 instances accounting for 39% of all (ing) tokens, which contrasts sharply with Fon et al.'s mere 25 instances.

The contrast between near non-existence in Fon et al.'s (2011) study and 20.5 percent in the current study, on the one hand, and the difference in frequency of the merger variant [in], on the other hand, may result both from methodological difference and social perception of the variant in question. Fon et al.'s study elicits readings of target words and sentences that contain syllable-final nasals, while the current study uses naturally occurring instances of the nasals from interview talk. Such a methodological difference may influence the results in a number of ways. First, subjects may perform differently in elicitations and in interviews. Elicited readings tend to increase subjects' awareness of their linguistic performance. It is likely that subjects pronounce each syllable more carefully when asked to read a word or a sentence than when responding spontaneously to an interview question, especially when a variant carries a negative connotation in the given social context (cf. Labov 1966). Fon et al.'s own study also identifies [in] as a stigmatized variant of (ing) according to results of a perception test. Given the methodological difference and social evaluation of [in], it comes as no surprise that the [in] variant would occur less frequently in Fon et al.'s data. Second, the difference in methodology would further result in differences in sampling the targeted syllables. Fon et al.'s experiment mainly elicits tokens that form a part of a content word (e.g. *liuxing* "meteor", *baoming* "to sign up"), while the current study includes any syllable-final nasals that occur in the interviews, resulting in a sample with both content and function words. In addition, interviews are closer to spontaneous speech, with certain words occurring more frequently than others, while elicited readings are much more controlled in this regard. It is likely that these methodological differences

contribute to the percentage differences in the two studies, although exactly how they do so requires further analysis and is beyond the scope of this study. Third, the percentage differences may partly be due to differences in how the data are coded, as Fon et al. use acoustic and perceptual cues and the current study relies on auditory perceptions. In sum, the incongruence of merger frequency may originate from methodological differences, but the general trends observed in both studies (that southerners lead in the (ing) merger) are consistent.

In contrast to the great gap between Taipei and Tainan subjects in their (ing) variation, the difference in (eng) variation between the two groups in this study is not as drastic, but is still statistically significant. In addition, the leaders are Taipei subjects, rather than Tainan subjects, in the use of merger variant [ən]. Table 9 above shows that Taipei subjects used the merger variant [ən] 42% of the time, whereas the same merger variant occurred only about 30% of the time among Tainan subjects. This result is also generally consistent with Fon et al.'s (2011) in the following senses. First, Taipei subjects (a.k.a. northerners in Fon et al.'s study) lead in the use of merger variant [ən]. Second, the (eng) merger is common in both Taipei (the north) and Tainan (the south); thus regional difference is not as great as that in (ing) variation. But there is again incongruence in details between the two studies. Fon et al. claim a high merging rate among northerners (between 55% and 95% across gender and elicitation conditions) and a low to medium merging rate among southerners (between 20% to 70% across gender and elicitation conditions, pp.285-286). The current study, in contrast, does not find the near complete merging identified in Fon et al. The merging rates among northerners and southerners across gender are 33% to 55% and 24% to 37%, respectively.³ The percentage differences, again, may lie in methodological differences. To sum up, although the current study and Fon et al.'s study have different data sources—the former from semi-structured interviews, the latter from controlled elicitation and experiments—general trends about regional differences and direction of mergers observed in the two studies are largely consistent, although minor differences remain.

In addition to the identification of regional differences, by examining how place of origin interacts and intersects with other social and contextual factors—current residence, topic, and gender—we can further explore the possible social meanings and implications of (ing) and (eng) variation. As shown in Table 10 and mentioned previously, current residence does not have a statistically significant effect on either the (ing) or the (eng) variation, but a trend parallel to the regional variation discussed above can be spotted: While subjects from Tainan are the leaders in the (ing) merger, subjects currently living in Tainan, regardless of their regional background, also have a stronger tendency to use

³ More discussion about gender is provided later.

the merger realization [in]. Likewise, while subjects from Taipei lead in the (eng) merger, subjects currently living in Taipei also tend to realize (eng) as [ən] more frequently than their counterparts living in Tainan. It appears that regional variation has an effect not only on subjects from the respective regions, but also subjects who currently reside in those regions. In other words, although one's place of origin plays a primary role in one's language variation, relocation or immigration also has some effect on one's language practice. Such a finding has several implications: First, the dialect one acquires early in life still has the most significant influence on one's language variation. Second, it does not mean, however, that one's pattern of language variation remains stable throughout one's life. Relocation and mobility may impact one's language variation as well. Third, methodologically, in our increasingly mobile world, it becomes rather pressing to recognize the fluidity of any given subject's language practice and to find ways to account for language variation caused by relocation when our goal is to explore the full picture of language variation in a given population.

The exploration of topic also gives us additional insight into the social meanings of (ing) and (eng) variation. As shown in Table 5 and Table 12, subjects tend to use the merger variants [in] and [ən] more when the interview topics proceed from their hometowns, to their observations of general language use in Taiwan, and then to language and politics in Taiwan. The overall pattern seems to indicate that as interviews proceed, subjects tend to become less formal and thus adopt more merger realizations. The gradual increase of merger variant is especially noticeable in the case of (eng) (as shown in Table 11), where a statistically significant difference is identified across the topics. Yet there is one salient exception: As Table 12 indicates, speakers from Tainan used [in] especially frequently (61%) on the topic of their hometown, followed by a sudden drop on the next topic, general language use (47%), and then an increase again (57%) on the topic of language and politics. They did not do so with regard to the (eng) variation which instead followed the general trend of mild but stable increase of merger realization (from 25%, to 30%, to 36%) as the speakers proceeded through the topics. The (ing) variation among Tainan subjects also contrasted sharply with that of its use by Taipei subjects, which, likewise, showed a mild but stable increase in merger realization (from 17%, to 21%, to 23%). These results indicate that the (ing) merger among Tainan subjects behaves in rather different ways from both the (eng) merger among themselves and the (ing) merger among their Taipei counterparts. The unique pattern, therefore, originates neither from the (ng) variation in general in Tainan, nor from the general behavior of (ing) across the north and the south.⁴

⁴ The tokens produced by MC, a male Tainan subject, provide a concrete individual example of such a pattern. MC produced 21 (ing) tokens in the sample, including a complete merging to [in] across 6 tokens on the topic of Tainan (*shuiping* “standard” [in], *jingji* “economy” [in],

A better explanation, instead, lies in the social meanings attached to the [in] variant in Tainan. Labov (1972b) categorizes sociolinguistic variables into indicators, markers, and stereotypes. Indicators are dialectal variables with little or no social significance attached. Differences are purely dialectal or regional and are not related to social or stylistic variation. Markers and stereotypes, in contrast, are variables carrying social information and figure in the variation across the level of formality continuum (i.e. stylistic variation). Markers and stereotypes can be further distinguished by speaker's level of consciousness—stereotypes have attracted so much attention that speakers can often discuss them metalinguistically, while markers have not induced such a heightened level of awareness. Similar ideas are also present in Silverstein's (2003) concept of indexical order. A first-order index in Silverstein's terms is equivalent to Labov's indicator—it simply indexes membership in a group. When social meanings associated with the group begin to attach to a linguistic variable, the link becomes a second-order index. The social evaluation can be further reinterpreted multiple times, thus creating an $n+1^{\text{st}}$ order index.

As mentioned previously, Tainan subjects use the merger variant of (ing) considerably more than their Taipei peers. The finding identifies an important dialectal difference, but cannot say anything further about whether such difference is associated with any social significance. In other words, based on Table 9, we can only establish the status of (ing) as an indicator in Labov's terms, or as a first-order index in Silverstein's terms. The exploration of topic, however, provides us additional information about the [in] variant. The especially high frequency of the [in] variant on the topic of their hometown among Tainan subjects, as shown in Table 12, indicates that the [in] variant is indexical of regional identity among the Tainan subjects. The variable has gone beyond the 1st order index; it has become symbolically connected to a cultural place (Johnstone 1999) and would be categorized as a marker in Labov's terms.

Additional support for the status of [in] as a regional marker can be found when we examine the words/phrases that contain (ing) when Tainan subjects discuss their hometown. If a variable is symbolically connected to a place, speakers may semi-consciously use the local variant more frequently not only when the topic is about the particular locale, but also when a particular lexical item containing the variable is semantically

jingguo “to pass through” [in], *bijing* “after all” [in], *Anping* “place name” [in], *Anping* “place name” [in]), a 50% merging rate on the following topic (*mingxian* “obvious” [in], *beijing* “background” [in], *tingqilai* “sound” [in], *hui ting taiyu* “understand Taiwanese” [in]), and a 82% merging rate on the last topic (*yingxiang* “influence” [in], *qingchu* “clear” [in], *tingzhe* “listener” [in], *yinggai* “should” [in], *bijing* “after all” [in], *beijing* “background” [in], *yiding* “definitely” [in], *zhengjing* “politics and economy” [in], *shiqing* [in] “a matter”, *qingchu* “clear” [in], *jieding* “limit” [in]).

related to the locale. In other words, in the case of the current study, it is likely that words which contain the (ing) variable and are associated with Tainan would show a higher percentage of merging rate especially on the topic of Tainan.

To further explore whether meaning affects variation, I compare Tainan and Taipei subjects' (ing) tokens on topic 3 (their respective hometowns) and topic 4 (their observations about general language use in Taiwan). The purpose of the comparison is threefold: first, to explore whether Tainan subjects' salient drop in merging rate from topic 3 to topic 4 has anything to do with the interview content of the two topics; second, to contrast Tainan subjects' pattern with that of Taipei subjects (which, as mentioned above, show an inverse trend in merging rate from topic 3 to topic 4); third, to provide concrete examples of the variable to the readers.

In total, 315 tokens of (ing) variable occur among Taipei and Tainan subjects on the two topics. One hundred and ninety three words/phrases containing the (ing) variable are identified, but most of them occur only once or twice across the two subject groups and the two topics.⁵ Words/phrases that occur five times or more are provided in Table 13 to show the general tendency of word occurrence. Table 14 lists words/phrases that occur three times or more by subject group and topic.

Table 13: Words/Phrases that occur five times or more among Taipei and Tainan subjects on topic 3 and topic 4

5-9	<i>beijing</i> “background” (5), <i>nianqing</i> “young” (5), <i>pingchang</i> “ordinary” (6), <i>bing/bingbu</i> “and/by no means” (7), <i>xing</i> (as in <i>gongnengxing</i> “functionality”, <i>caogenxing</i> “grass root”, etc.) (7), <i>yijing</i> “already” (8)
10-14	<i>mingxian</i> “obvious” (13), <i>Anping</i> “a district of Tainan City” (14), <i>yiding</i> “definitely” (14)
15-30	Not applicable
31-40	<i>yinggai</i> “should” (33), <i>ting</i> “listen, hear” (39)
41-50	Not applicable
51-	<i>yingwen/yingyu</i> “English” (57)

⁵ The identification and categorization of the words/phrases in question are meaning-based, since the goal is to investigate the relationship between meaning and variation. *Yingwen* and *yingyu* are treated as one category because the two terms refer to the same language and are used interchangeably by the interviewees.

Table 14: Words/Phrases that occur three times or more by subject group and topic, ranked by frequency of occurrence

	Tainan subjects	Taipei subjects
Topic 3 (hometown)	<i>Anping</i> “a district of Tainan” (10/14) <i>yinggai</i> “should” (3/11) <i>mingxian</i> “obvious” (1/5) <i>qingchu</i> “clear” (3/3) <i>bing/bingbu</i> “and/by no means” (2/3) <i>ting</i> “listen, hear” (1/3)	<i>yinggai</i> “should” (0/7) <i>ting</i> “listen, hear” (1/5) <i>mingxian</i> “obvious” (1/4) <i>yijing</i> “already” (1/4) <i>yiding</i> “definitely” (0/3)
Topic 4 (general language use)	<i>yingwen/yingyu</i> “English” (10/25) <i>ting</i> “listen, hear” (7/16) <i>yinggai</i> “should” (2/9) <i>yiding</i> “definitely” (3/4)	<i>yingwen/yingyu</i> “English” (6/31) <i>ting</i> “listen, hear” (2/15) <i>yinggai</i> “should” (3/6) <i>yiding</i> “definitely” (0/6) <i>pingchang</i> “ordinary” (1/4) <i>beijing</i> “background” (1/4) <i>bing/bingbu</i> “and/by no means” (1/3) <i>yingguoqiang</i> “British accent” (1/3) <i>lingwai</i> “besides” (1/3) <i>nianqing</i> “young” (0/3)

Note: Merging rates are shown in parentheses. Denominator indicates total number of tokens. Numerator indicates the occurrences of merger variant [in].

As Table 14 shows, on topic 4, Tainan and Taipei subjects are rather consistent with regard to frequency of occurrence of tokens. Since the topic is the subjects’ general observations about language use in Taiwan, the two groups show similar tendency in word occurrence, to the extent that the first four items—*yingyu/yingwen* “English”, *ting* “listen, hear”, *yinggai* “should”, *yiding* “definitely”—are ranked in exactly the same way. Merging rate of each individual word/phrase also indicates a similar pattern with the overall merging rate shown in Table 12, with Tainan subjects merging more frequently than their Taipei peers. A comparison of topic 3 across the two subject groups, in contrast, shows more diversity, which likely reflects the more varying responses across Taipei and Tainan subjects in relation to their respective hometowns. Topic 3 and topic 4 among Tainan subjects also show some differences. One particular noticeable phenomenon is the high occurrence of the token *Anping*, a place name in Tainan, accompanied by a saliently high merging rate of 10/14.

To investigate the association of place name and merging rate further, I locate 17 tokens forming part of a local place name among the 85 tokens of (ing) produced by Tainan subjects on the topic of their hometown (i.e. topic 3), including the afore-

mentioned *Anping* (14 tokens), *Yanping junwang* (a historic site, one token), *Dongying Lu* (Dongying Road, one token), and *Fuxing* (a school name, one token). These tokens associated with a particular locale in Tainan have a 71% merging rate. The other 68 tokens show a merging rate of 59%. Both are much higher than the 47% merging rate of the following topic by the same group of subjects (see Table 12). The especially high merging rate of tokens associated with Tainan suggests that subjects are likely semi-consciously projecting their local identity through the use of the [in] variant. The other tokens on the same topic, though not showing as high a merging rate, still outweigh those of the next topic by 12%. Regional awareness appears to play a role both in the overall merging rate and in that of tokens specifically associated with Tainan.

One may argue that most of the tokens associated with Tainan are from the place name *Anping*. We cannot rule out the possibility that the word is simply an idiosyncrasy and, for some unknown reason, is particularly advanced in the merging process. Without enough evidence from other place names, we cannot be 100% sure that the high merging rate of 71% can indeed be contributed to regional identity. While such an argument is certainly valid, as mentioned above, the other tokens on the same topic also show a higher degree of merging (59%) than those produced in response to the next topic. It seems that a general trend of a higher merging rate on the topic of Tainan still exists, no matter whether the *Anping* tokens are included or not. Additional support of the influence of regional awareness on variation can be found when we compare the merging rate of (ing) in *Anping* and that of other tokens containing the same character/syllable *ping* on topic 4 produced by the same group of subjects. Five tokens containing *ping* are identified, including *pingchang* “ordinary”, *xinpingqihe* “calm, even-tempered”, *yanping dalou* “(a building name)”, *pingpuzu* “Pingpu tribes”, and *gongping* “fair.” The merging rate is only 2/5 (40%), which is much lower than *Anping*’s 71% on topic 3. This is yet another piece of evidence to show that the merger variant [in] is indeed associated with regional awareness to a certain degree.

The discussion above demonstrates that the social meaning(s) of (ing) among Tainan subjects is different from those of (ing) among Taipei subjects and of (eng) among all subjects. The (eng) variation does not seem to be associated with regional awareness, as Taipei subjects, the leaders of the (eng) merger, do not show a higher frequency of [ən] on the topic of their hometown. The (eng) variation, instead, responds to the continuum of level of formality—subjects tend to use the [ən] variant more toward the later section of the interviews, possibly due to a more relaxed mentality when attention is not focused on the recording process. One can infer that the meaning of variable (eng) is more general: it indexes degree of formality and standardness. The meaning of the variable (ing), in contrast, may operate in two ways: In a more general sense, it indexes degree of formality and standardness as (eng) does. Nevertheless, it is also specifically connected to regional

awareness in contexts relevant to the particular locale. The finding suggests that stylistic variation may operate along more than one dimension, contrary to what Labov (1966) indicated. The interaction of the two dimensions (i.e. degree of formality and regional awareness) is also likely the source of the unique drop-and-rise pattern of (ing) observed among Tainan subjects (61%, 47%, 57%, see Table 12), as there are two contrasting forces at work.

In addition to current residence and topic, the interaction between gender and region in relation to (ing) and (eng) provides another source to explore the social meanings and implications of (eng) and (ing) variables. As previously mentioned, Goldvarb analysis of (ng) indicates that gender is a significant factor influencing the variation of (ng), with males using the merger variant more than females (see Table 5). Table 8 further reveals that though males in general use the merger variant more frequently, there is a major difference between (ing) and (eng): Gender difference is highly salient and statistically significant in (ing), but, in contrast, the difference is quite small in (eng). It can be inferred, according to the patterns of variation identified so far, that (ing) functions both as a regional and gender marker, while the association of region and gender with (eng) is much weaker. But which of the two, region or gender, has a stronger effect on (ing) variation? How do the two social factors interact with each other?

To answer these questions, I further explore (ing) and (eng) variations by examining the interaction of two factors: place of origin and gender. The results are shown in Table 15 below. In terms of (ing) variation, Tainan males are the leaders in the merger (69%), followed by Tainan females (44%), Taipei males (28%), and lastly, Taipei females (12%). The pattern is highly systematic: Place of origin appears to play a primary role, with gender playing a secondary role. The pattern of variation of (eng), in contrast, is not as clear-cut. Taipei females are the leaders (55%), followed by Tainan males (37%), Taipei males (33%), and Tainan females (24%). There does not seem to be a clear trend in terms of gender or region, but the frequency rank is generally consistent with Fon et al.'s (2011) experimental findings, which also indicate that northern females lead the (eng) merger, that southern males and northern males are roughly comparable, and that southern females have a lower merging rate than others. The consistent results between the two studies suggest that the seeming lack of a clear pattern is not caused by sampling errors. Instead, the pattern most likely reflects the variation of (eng) rather precisely.

Table 15: Percentage of alveolar realization of (ing) and (eng) by gender and subject's regional background

	(ing)		(eng)	
	Tainan	Taipei	Tainan	Taipei
Male	69	28	37	33
Female	44	12	24	55

The patterns of variation identified above can be further interpreted in light of the 2011 findings by Fon et al. about the perception of the standardness of the mergers and their discussion of possible causes. Fon et al. find that the merger variant [in] is generally perceived as rather non-standard, and argue that the merger is fairly likely due to negative transfer from Min, as southern dialects of Southern Min in Taiwan allow [in] but not [in̩]. The Chôan dialect of Southern Min spoken in the north, in contrast, allows both [in] and [in̩]. Such a contrast would explain why northerners do not adopt the merger variant as frequently as southerners (p.298). In other words, the regional variation of (ing) identified in both Fon et al.'s study and the current study may originate from dialectal difference of Southern Min in Taiwan, specifically, from negative transfer from the Southern Min dialects in the south.

Fon et al.'s (2011) argument of negative transfer from the Min dialects in the south provides an historical account of the possible cause of greater use of the merger variant [in] among Tainan subjects. They also argue that negative transfer may result in negative perception of the variant, "since negative transfer predicts that the merger is highly marked" (p.298). Fon et al. do not further explain the implication of this prediction, but to push the argument further, we may infer that negative transfer may symbolically index a limited proficiency in the second language, thus resulting in negative social evaluation of the variant.

Yet, as discussed previously, the [in] variant has also been adopted frequently on the topic of hometown among Tainan subjects, implying a link between the variant and regional identity. In other words, the Tainan subjects are not passive speakers with a fixed regional accent that they cannot get rid off, but are likely semi-consciously using the merger variant as a resource to express nuance of meaning in the interviews. Zhang (2005) and Coupland (2001) have also identified a similar connection between topic about a particular place and an increase in variants associated with that locale. Zhang's (2005) variation study examines the use of Beijing vernacular features among Beijing professionals working in foreign businesses and finds that they use the vernacular features significantly more on the topic of local culture than on work-related topics. Coupland's (2001) study about the indexing of Welsh identity on a radio talk show also points out the greater use of features associated with the Welsh accent on the topic of

Welsh culture. Zhang, Coupland, along with the current study, all suggest that intra-speaker variation (or stylistic variation) is not just along the continuum of formality, with ‘standard language’ associated with higher attention paid to speech, and ‘vernacular’ or ‘non-standard features’ associated with lower attention paid to speech, as classically operationalized by Labov (1966). Instead, ‘non-standard’ language may be associated with regional identity and becomes a resource to help project a desired social image in a particular moment of talk.

In addition to status being a regional marker, another salient aspect of the (ing) variation is gender difference. As mentioned above, male speakers tend to use the [in] variant more frequently while female speakers are more inclined to use the textbook pronunciation [iŋ], and the same pattern exists in both the Taipei and Tainan groups. Sociolinguistic literature, as mentioned previously, has pointed out that female speakers tend to focus more on linguistic variety associated with ‘overt prestige’, while male speakers, especially those from the working class, may instead seek ‘covert prestige’ associated with the vernacular variety. The gender-related distribution of (ing) variation is consistent with the accounts from the literature.

However, the same pattern with regard to gender cannot be found in (eng) variation. Females do not necessarily use the textbook pronunciation [əŋ] more frequently. In fact, Taipei females are the leaders of [ən], the merger variant. Works in variationist sociolinguistics have also pointed out that while females tend to be more conservative in the use of stigmatized non-standard features, they are also often innovators and leaders in language change when the features in question are not negatively evaluated. Labov (1990) summarized results of more than thirty years of sociolinguistic research and concluded with the following principles:

Principle I: In stable sociolinguistic stratification, men use a higher frequency of nonstandard forms than women (p.210).

Principle Ia: In change from above, women favor the incoming prestige forms more than men (p.213).

Principle II: In change from below, women are most often the innovators (p.215).⁶

Labov’s principles provide us a general picture of the interaction between the two genders’ patterns of variation and the level of social awareness/evaluation associated with the variable in question.⁷ The contrast between female subjects’ use of (ing) and

⁶ Change from above/below refers to change above/below the level of consciousness/social awareness. In other words, the former indicates more conscious change while the latter indicates unconscious change (Labov 1990, 1994).

⁷ I use Labov’s principles here in the sense that they provide us a glimpse into the relationship

(eng) variables seems to correspond to the two principles identified by Labov (1990), that is, we can infer that while [in] has a somewhat negative connotation (as born out in our previous discussion) and is thus avoided by females, [ən], in contrast, is likely a variant that is neutrally (or positively) evaluated.

Again, support of this inference can be found in Fon et al.'s (2011) discussion on the perception of standardness and the possible cause of (eng) variation. In terms of the perception of (eng), Fon et al. identify a regional difference: "northerners found it [the merger realization] relatively standard, while southerners regarded it as somewhat non-standard" (p.296). Fon et al. further explore the possible cause of (eng) variation, and argue that since neither [ən] nor bare [ɤŋ] are permissible in Southern Min, it is unlikely that the merger originates from negative transfer. Thus the possible cause of (eng) variation is likely to be different from that of (ing) variation, which may further contribute to a more lenient attitude toward [ən] than [in] even though [ən] is still a non-standard feature (pp.297-298).

Fon et al.'s (2011) finding can help interpret the (eng) variation's seeming lack of a clear pattern in relation to gender. Results in Table 15, as mentioned above, show that Taipei females are the leaders in the use of the [ən] variant among the four groups. Tainan females, in contrast, are the group that uses the merger variant least frequently. In light of Fon et al.'s finding of regional difference in perception of the variable, we can infer that since [ən] is evaluated relatively positively in Taipei and is likely to be taken as an innovative form, females do not shy away from using this variant, and in fact, are the leaders of the non-textbook usage. Their leadership is not surprising, given that female speakers are often described in past studies as innovators and leaders of language change (see Labov's 1990 Principle II quoted above). In contrast, [ən] is evaluated somewhat negatively in Tainan. Fon et al. suggest that the slight negative connotation may originate from the similar phonological process between the [ən] merger and the [in] merger; the latter is especially robust in the south. Female speakers in Tainan thus do not use it as frequently as Tainan males or Taipei females. Both patterns correspond to the description in sociolinguistic literature. The seemingly irregular pattern identified in this study can be explained when we take both Fon et al.'s observation of perceptual difference and the variationist sociolinguistics' account of gender and language change into consideration.

The above discussion about the indexical and social meanings of the two mergers is summarized in Figure 2 below.

between gender, social awareness, and variation, but I do not wish to claim that the variation of (ng) identified in this study is either a case of change in progress or long-term stable variation. Variation does not always lead to change, and without more comparable real-time data, it is difficult to make any claims in this regard.

	<i>linguistic cause</i>	<i>indexical of</i> ⇒ Limited proficiency in Mandarin	<i>perceived as</i> ⇒ Negative	<i>resulting in</i> ⇒ Females' lesser use
[in]	Negative transfer from southern dialects of Southern Min	⇒ Southern identity	⇒ Positive	⇒ Southerners' greater use in general and in hometown-related topics
[ən]	Possibly a product of language contact, common in both the north and the south	⇒ Common feature of Taiwan Mandarin	⇒ Somewhat positive in the north, an innovation ⇒ Somewhat negative in the south, reminiscent of (ing) merger	⇒ Taipei females' greater use ⇒ Tainan females' lesser use

Figure 2: The development of social meanings of the two merger variants

The trajectories identified in Figure 2 provide a first sketch of the development of social meanings of (ing) and (eng), but the social life of a variable does not end with such a figure. As Eckert (2008) points out, the meanings of variables are never fixed but are constantly emerging based on existing indexical meanings, or *n*th order indexicality in Silverstein's (2003) terms, resulting an *n*+1st value in each interactional moment. A related theoretical concept is Agha's (2005, 2007) 'enregisterment', defined as "processes whereby distinct forms of speech come to be socially recognized (or enregistered) as indexical of speaker attributes by a population of language users" (2005:38). A salient example of the enregisterment of a particular phonological feature is provided in Zhang's (2008) discussion of rhotacization, or *er-hua* in Beijing Mandarin. According to Zhang, rhotacization takes on its saliency "through frequent co-occurrence with key Beijing cultural terms and frequent use in written representations of authentic Beijing-ness" (p.201). The [in] and [ən] variants have not reached the fully enregistered state yet, but given the very systematic connection to region and gender in the case of [in], we can predict that [in] is more advanced than [ən] in the process of enregisterment and is already well into the process of becoming a genuine sociolinguistic marker.

5.2 One variable or two?

It should have become rather apparent by now that (ing) and (eng) behave quite differently in terms of their social implications and should be treated as two separate variables rather than one with two phonological conditions. As previously shown in Tables 6 and 7, the considerable strength of region and gender in the case of (ing) could

be overlooked when (ng) is treated as one variable (as in Table 5). The methodological implications of this can also partially explain the incongruous results between the past studies about nasal mergers in two senses. First, the regional difference identified in the current study and in Fon et al.'s (2011) study may explain and help resolve the different (and sometimes contradictory) results regarding the direction of mergers obtained in previous studies, as previous studies usually do not consider regional differences and do not control this factor in their research designs. Second, the methodological implications can also explain differences in statistical results about gender between the current study and some of the past studies reviewed in Table 1 as some of them do not separate /ŋ/ preceded by different vowels when exploring the effect of gender on its variation.

5.3 A comparison of Fon et al. (2011) and the current study

Fon et al. (2011) is the first systematic study of dialectal variations on syllable-final nasal mergers in Taiwan Mandarin. The current study also deals with sociolinguistic variation of syllable-final nasal mergers, using a different method and focusing more on the social implications of the related findings. The results of the two studies show both similarities and differences. In this section, a comparison of the two studies is provided. Such a comparison may bring us additional insight into the complexity of these mergers.

In terms of methodology, Fon et al. (2011) use an experimental method with elicited readings and acoustic analysis, while the current study analyzes interview data and codes tokens with auditory perception, a common practice in variationist sociolinguistic studies. Independent variables respectively include dialect, gender, and condition (*zhuyin*, character, or sentence) in Fon et al.'s study, and place of origin (equivalent to dialect in Fon et al.), gender, topic, and current residence in this study. The two studies share a common interest in place of origin/dialect and gender. Results regarding place of origin/dialect are largely consistent, with minor incongruence in details such as merging rates. With different types of data, the two studies both show that northerners lead in the (eng) merger while southerners are more advanced in the (ing) merger. The similar results prove that dialectal difference is indeed a major factor at play in syllable-final nasal mergers in Taiwan. Results regarding gender, however, are not as strongly conclusive as those of place of origin/dialect. Both studies identify an interaction between gender and dialect in (eng) variation, with Taipei females leading in the merger and Tainan females the least involved. In terms of (ing), the current study identifies a strong gender effect, yet in Fon et al. the gender factor is not statistically significant.

Previously in §5.1, I discussed how methodological differences may contribute to differences in merging rates and number of tokens in the two studies. The different results regarding gender may also be related to methodology. As mentioned previously,

Fon et al. (2011) only identify 25 instances of merger variant [in] in their sample, which is in sharp contrast to 190 instances in the current study. The negative social perception of the [in] variant in general, coupled with subjects' heightened awareness of one's linguistic performance in elicited readings, might be responsible for the low frequency of [in] in Fon et al.'s data. With a small number of tokens, it is difficult to observe a clear trend. Fon et al.'s result of non-significance, thus, does not really challenge the strong gender effect identified in the current study. The seemingly different results regarding gender may thus be due to methodological differences rather than any substantial contradiction.

My previous discussion also points out other possible implications of different methodologies, as experimental design and elicited readings tend to be more controlled but detached from natural speech, while semi-structured interviews are closer to spontaneous speech but less controlled, making it harder to tease out the effects of all the relevant factors. Results from the two studies thus complement each other and provide us a fuller understanding of the variation of syllable-final nasal mergers in different contexts. The respective methodologies also correspond to the different theoretical orientations of the two studies: Fon et al. focus on the phonologization process of the mergers, while the current study explores the social meanings and implications of the variation and interprets the data in light of sociolinguistic theories.

6. Conclusion

This study examines the variation of syllable final nasals (ing) and (eng) in Taiwan Mandarin and demonstrates that language external factors, including speaker's place of origin, gender, current residence, and topic all influence the two variables, but to different extents. Place of origin is the most salient factor showing statistically significant effects on the variation of both (ing) and (eng). Its especially strong effect on the variation of (ing), coupled with the frequent occurrence of [in] on the topic of hometown among Tainan subjects, indicates a close association between the merger variant [in] and regional identity among the southern subjects. Gender also plays a substantial role in the variation of (ing), with males using the merger variant [in] significantly more than female subjects across both the Taipei and Tainan groups. Gender, however, has no statistically significant effect on the variation of (eng). A further examination of the distribution of the merger variant [ən] in relation to gender and region shows that Taipei females are leading in the use of [ən] while Tainan females use it least frequently, with Taipei and Tainan males falling in between. The seemingly irregular pattern with regard to gender, however, is consistent with findings from Fon et al. (2011). Drawing on Fon et al.'s perception test results, this study infers that [ən] is evaluated differently and associated with distinctive

social meanings particular to the Taipei and Tainan female subject groups. The differential perceptions and linguistic behaviors further confirm that regional difference is a crucial factor in understanding the variation of syllable final nasals in Taiwan. Based on findings from Fon et al. and from the current study, I have provided a sketch of the emergence and development of the social meanings of the two variables in Figure 2 above. The variant [in] is positively associated with southern identity and negatively associated with limited proficiency in Mandarin, which correlates with greater use of the variant among southerners and lesser use among female subjects. The social connotations of the variant [ən], in contrast, do not seem as straightforward as those of [in], but it is suggested in Fon et al. that [ən] is positively treated as an innovation in Taipei and negatively evaluated through analogy with [in] in Tainan. Taipei females' leading role, thus, is consistent with discussion about gender in the literature of variationist sociolinguistics, in which females are often described as playing a leading role in linguistic innovation. Tainan females' lesser use of [ən], in contrast, may be due to a perceptual difference in the north and south that prompts Tainan females to shun from using a somewhat negatively evaluated feature; this also corresponds to sociolinguistic literature's description of female's lesser use of negatively connoted features. The perceptual and behavioral difference in relation to gender is yet another piece of evidence to treat Taipei and Tainan as two dialect regions of Taiwan Mandarin and to stress the importance of taking regional difference into consideration when studying language variation in Taiwan Mandarin. In a more general sense, this study also confirms Her's (2010) argument in a review article that Taiwan Mandarin has indeed been indigenized, given that Taiwan Mandarin is regionally and socially diversified and stratified, as shown in the results of this study. Future studies may dig into the social implications of (ing) and (eng) further either by observing variation among a larger population (for example, to include subjects of different ages and socio-economic statuses), as the first wave of variation studies do, or by observing closely what social functions the variants serve in interactions and the process through which their social meanings are generated.

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台灣華語音節末鼻音合流變異現象之社會意義

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本文檢視台灣華語音節末鼻音合流現象（含 (ing) 及 (eng) 之變異）與社會因素（含受訪者之地域背景、性別、現居地、及訪問主題）之間的關連。結果顯示地域背景與此變異現象之相關度最高，但 (ing) (eng) 表現不同，兩者之合流分別和台南台北兩地較為相關。性別也與 (ing) 之變異有顯著關連，但與 (eng) 的關係較不明確。本文並根據社會語言學變異研究之性別的理論及 Fon et al. (2011) 的感知測驗結果推導 [in] 與 [ɔn] 兩合流音其社會意義之演變。

關鍵詞：語言變異，地域差異，性別，音節末鼻音合流，社會意義