NASALS: A SOCIOLOGUISTIC STUDY OF CHANGE IN PROGRESS

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1. A noticeable characteristic of PANAMERICAN SPANISH is the tendency to weaken the articulation of syllable-final consonants. Thus, /l/, /r/, /s/, /z/ and /n/, the only consonants occurring regularly in final position in MODERN SPANISH, exhibit variability of their phonetic realization in Panama. In this paper we examine the linguistic conditions of the alternation of syllable-final nasals in the SPANISH of Panama City, the relationship of social factors to nasal variability, and the social dimensions of nasal reduction within the City of Panama.

2. The distribution of syllable-final nasals in STANDARD SPANISH is well documented (cf. Navarro-Tomás, 1962; Harris, 1969). Before a following vowel or in prepausal position, they are realized as [n]:

(l) estan[n] alla 'they are there'
    ¿cómo estás[n] 'how are they'

Within the word, before consonants, they are always homorganic, as in (2), where [m] represents a labiodental, [y] a dental, [h] an alveopalatal, [g] a palatal nasal:

(2) ca[m]bo  caf[r]bo  caf[r]chino  caf[r]go
    'field'    'field'    'shovel'    'five'
    ca[m]bo  ca[m]bo  ca[m]boge  ca[m]bo
    'change'    'when'    'spouse'    'the conga'
    ca[m]bexmo  ca[m]bo  ca[m]bge  ca[m]bo
    'to tire'    'to tire'    'the conga'
    ca[m]bexmo  ca[m]bo  ca[m]bexmo  ca[m]bo
    'immense'    'immense'    'immense'
    ca[m]bo  ca[m]bo  ca[m]bo
    'core'    'bond'    'mix-up'

Across word boundary, in casual speech, nasals assimilate to the place of...
of articulation of the following consonants:

(3) co[m] padre co[n] tanto co[n] chicos co[η] cancos
‘with father’ ‘with much’ ‘with kids’ ‘with helmets’
co[m] bancos co[n] discos co[n] yates co[η] gatos
‘with benches’ ‘with records’ ‘with yachts’ ‘with cats’
co[n] fuego co[n] sapos
‘with fire’ ‘with frogs’

The distribution of nasals is, therefore, accounted for by an assimilation rule of the form:

(4) [+nasal] → [N] [place] / [C] [place]

PANAMANIAN SPANISH, in contrast, has the following distribution of syllable-final nasals:

(5) a. ca[m]bo ca[a]bo 'field'
ta[m]baco ta[a]baco 'neither'
cal[η] bo ca[η] bo 'I sing'
ap[η] hora pa[η] hora 'panther'
cil[η] bo cil[η] bo 'five'
hil[η] car cil[η] car 'to kneel'
cal[n]bo ca[n]bo 'change'
ta[n] bor ta[n] bor 'drum'
cua[n] bo ca[n] bo 'when'
ma[n] bona ma[n] bona 'bossy'
col[η] ga co[η] ga 'the congac'
col[η] golones co[η] golones 'congoles'
b. sil[n]bo sil[n] bo 'nymph'
tri[n]bo tril[n] bo 'triumph'
cal[η] bo ca[η] bo 'to tire'
as[n]isoso as[n] isoso 'anxious'
ra[n]bo ra[n] bo 'ranch'
col[η] sardo co[n] sardo 'fearless'
col[n] juge co[n] juge 'spouse'
bis[n]bo bis[n] bo 'hymn'
t[m] mensa ti[m] mensa 'immense'
cal[n] nisia cal[n] nisia 'standar'
bo[n] rado bo[n] rado 'brando'
es[n] lace es[n] lace 'lace'

c. co[m] padre co[η] padre
c[η] padre 'with much'
c[η] tanto 'with kids'
c[η] banco 'with benches'
c[η] discos 'with records'
c[η] yates 'with yachts'
c[η] gatos 'with cats'
c[η] sapos 'with frogs'
c[η] chicos 'with kids'
c[η] chicos
co[n] chicos
co[n] chicos
co[n] sapos 'with frogs'
c[η] yates 'with yachts'

d. all[η] est[a]n 'they are there' est[a]n atados 'they are tied up'
all[η] est[a]n
all[η] est[a]n

The examples illustrated in (5) demonstrate that although a rule of nasal assimilation is needed in a description of PANAMANIAN SPANISH, the rule is optional rather than obligatory as in other dialects. In addition, the data reveal that the syllable-final nasal may be produced as an unassimilated velar or it may be deleted. These facts may be stated in the following rule:

(6) a. [+nasal] → [+ back] / Optional
b. [+nasal] → 5 / Optional

The data displayed in (5) show that syllable-final nasals do not have a velar alternant before stops. In contrast, across word boundary all forms have three variants. It is therefore clear that the 5 in the
environment of (5a) is not a sufficient condition for spirantization. The rule may be modified as follows:

(7) a. [+ nasal] \( \rightarrow \) [+ back] / [+ continuant] \( \{\) [-obstruct]\(\} \) Optional

b. [+ nasal] \( \rightarrow \) [+ back] / 

In addition, there are cases of word internal spirantization before a following vowel initial stem:

(8) \( \emptyset \) [\( \emptyset \) ] human \( \emptyset \)
\( \emptyset \) [\( \emptyset \) ] aceutico \( \emptyset \)
\( \emptyset \) [\( \emptyset \) ] siguo \( \emptyset \)

The velar alternant does not occur before suffixes; it is limited to pre-stem position:

(9) canción + ero

The following statement is also needed to account for the spirantization of nasals in prefixes:

(10) [+ nasal] \( \rightarrow \) [+ back] / + [stem]

Vowels are optionally nasalized before a following nasal: [\( \emptyset \) [\( \emptyset \) ]] [\( \emptyset \) [\( \emptyset \) ]] [\( \emptyset \) [\( \emptyset \) ]], but they are always nasal when the consonant has been deleted. The rule which accounts for nasalization must apply before effacement.

There is still another rule in the dialect which is critically ordered before effacement. This is the rule of spirantization. This rule accounts for the alternations b-\( \beta \), d-\( \delta \), g-\( \gamma \). Stops normally occur initially, after nasals and after \( /l/ \), in the case of \( /d/ \). For example,

(11) b[aõ]) carn[bõ]) cal[b])
'batch' 'change' 'its'

(12) c[aõ]) cus[d]) cal[d])
'damage' 'when' 'when'

(13) [g]=to ten[g]) la[g])
'cat' 'have' 'lake'

In PANAMANIAN SPANISH, the stop variants also occur after nasalized vowels, as in (12):

(12) c[aõ]) ten[g])
'batch' 'have'

c[aõ]) car[b])
'change' 'its'

cus[d])
'damage' 'when'

There are two possible explanations to account for these examples. One alternative would be to claim that the dialect does not share the same spirantization rule with other dialects of SPANISH. In this case, the presence of a nasal vowel would also block the application of the rule. However, it is inconceivable that nasal vowels should behave differently from oral vowels with respect to spirantization. We, therefore, adopt the alternative solution which is to order spirantization before nasal effacement.

3.1. The rules that have been proposed to account for nasal assimilation, nasal spirantization and nasal effacement do not explain why nasal consonants alternate in PANAMANIAN SPANISH. As optional rules they make no claims about rule execution frequencies, and they are not interpretable as reflections of an on-going sound change in the dialect.

This section discusses an empirical analysis of the alternation of syllable-final nasals in Panama City. The analysis is based on recorded samples of speech from 75 SPANISH speaking residents interviewed in a survey of the city (Cedergren, 1973).

Of 838 instances of word final nasal segments were tabulated in the corpus. Three variants, NA, NV, and NE, were distinguished; NA represents surface phonetic variants accounted for by nasal assimilation, and the instances of [\( \emptyset \) ] before a following initial vowel or pause. Excluded from the analysis are the ambiguous cases of [\( \emptyset \) ] which could be accounted for either by nasal assimilation or by velarization: the occurrences of [\( \emptyset \) ] before [\( \emptyset \) ] or [\( \emptyset \) ]. NV refers to all other cases of [\( \emptyset \) ] in the corpus. NE represents examples of nasal effacement.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>DISTRIBUTION OF NASAL VARIANTS IN THE CORPUS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>1%</td>
</tr>
<tr>
<td>(total)</td>
<td>838</td>
</tr>
</tbody>
</table>

NA = assimilation, NV = velarization, NE = effacement

The distribution of the variants in Table 1 reveals that speakers in Panama City show a definite preference for the velarization and effacement of final nasals. In fact, the extremely low frequency of NA cases proves that nasal assimilation is not a productive phonological process.
In the community, Table 1 provides ample evidence that PANAMERICAN SPANISH is progressing towards the elimination of nasal segments in derived forms with 68% of nasal effacement.

The effects of the following initial segment, any consonant (C), any vowel (V) or pause (P), and the social context as revealed by the age, socio-economic class and origin of the speakers were also investigated.

**Table 2. Relative Distribution of Nasal Variants by Following Segment**

<table>
<thead>
<tr>
<th>Variant</th>
<th>C</th>
<th>V</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>NV</td>
<td>24</td>
<td>41</td>
<td>34</td>
</tr>
<tr>
<td>NE</td>
<td>74</td>
<td>58</td>
<td>69</td>
</tr>
<tr>
<td>(total)</td>
<td>(4460)</td>
<td>(2759)</td>
<td>(1912)</td>
</tr>
</tbody>
</table>

Table 2 shows that neither velarization nor effacement is restricted to a particular environment, but the distribution of the variants is sensitive to the type of following segment. The incidence of NV is favored more by a following V than by a following C, whereas NE increases when the following initial segment is a C. The utterance final effect, P, is a separate constraint affecting both velarization and effacement in a consistent manner; it is ordered between the consonant and vowel effects.

These results may be summarized as two variable rules of the form:

(13a) $[+$ nasal] $\rightarrow$ $<$ back $> / \begin{cases} V \ \ P \end{cases}$

(13b) $[+$ nasal] $\rightarrow$ $<$ p $> / \begin{cases} C \ \ V \end{cases}$

where the angled brackets in the output of the rules indicate that rule execution is greater in certain contexts than in others. The angled brackets in the environment of the rule should be interpreted as summarizing the contexts that favor the operation of the rule. The order of the effects is indicated by their position in the brackets.

3.2. These rules reveal the importance of distinguishing the type of segment immediately following the underlying nasal, and indicate that the frequency of velarization or effacement is associated with a reversal of constraints, but they do not permit any inference on the degree to which a particular factor influences their execution probability.

To determine the degree of feature effects on the frequency of velarization and effacement we make use of a maximum likelihood estimation procedure based on the model

$$p = \frac{p_1}{1-p_1} \times \frac{p_2}{1-p_2} \times \frac{p_3}{1-p_3} \times \cdots$$

where $p$ is the probability of rule application, which is a function of $p_1, p_2, p_3, \ldots$. Each feature relevant to the structural description of the rule is associated with a probability $p_1$ which represents the effect of feature $i$ on the value of $p$ for rule $(X)$. The input probability $P_0$ is the probability that the rule will apply when all other features in the environment have no effect on the rule, that is, all $p_1, p_2, p_3, \ldots$ equal 1. When $p_1$ is 1/2 it has no effect on the rule, whereas values greater than 1/2 favor the rule, and values less than 1/2 inhibit it (Salaff, 1975).

The data on which the estimation is based consist of the number of times a rule occurred, i.e., velarization or effacement -- has applied out of the total number of cases examined for a particular environment.

In the analysis we incorporated information on the linguistic environment of the nasal and the social characteristics of the speakers: age, class and origin. The results displayed in Table 3 (see page 74) are a striking confirmation of the relationship described by rules (13a) and (13b).

A following V and P favor velarization with values of .66 and .66, respectively, and the presence of a following C favors derived forms with no final nasal consonant.

The rules are also sensitive to social factors. The local origin of the speakers has a considerable effect. The greater influence of local origin is associated with velarization; the range of difference between the most positive and the least favorable factors in the group is .66, the range for effacement is only .32. The speakers in the community are split into two distinct groups with respect to velarization:
TABLE 3. FACTOR VALUES FOR CONSTRAINTS ON VELARIZATION
AND EFFACEMENT.

<table>
<thead>
<tr>
<th></th>
<th>VELARIZATION</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Age</td>
<td>Origin</td>
<td>Status</td>
</tr>
<tr>
<td>C</td>
<td>.25</td>
<td>A (young)</td>
<td>U (urban)</td>
</tr>
<tr>
<td>Y</td>
<td>.66</td>
<td>B</td>
<td>T</td>
</tr>
<tr>
<td>P</td>
<td>.69</td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>D (old)</td>
<td>R (rural)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>EFFACEMENT</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Age</td>
<td>Origin</td>
<td>Status</td>
</tr>
<tr>
<td>C</td>
<td>.60</td>
<td>A (young)</td>
<td>U (urban)</td>
</tr>
<tr>
<td>Y</td>
<td>.42</td>
<td>B</td>
<td>S</td>
</tr>
<tr>
<td>P</td>
<td>.46</td>
<td>C</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>D (old)</td>
<td>R (rural)</td>
<td></td>
</tr>
</tbody>
</table>

C = consonant, V = vowel, P = pause; A = 14-20, B = 21-35, C = 36-50, D = 51+; U = city born, T = arrived during childhood, S = adolescent arrivals, R = adult arrivals; E = upper-middle, F = lower-middle, G = working class, H = lower class.

those speakers who moved to the city after childhood, S and R. are strong contributors to the rule, whereas childhood immigrants, T, and similarly the natives of Panama City, U, are shown to have negative effects on the same rule. Effacement is less sensitive to the origin of the speakers even though the groups maintain the same relative order.

This pattern of effects indicates that velarization and effacement originated in the rural areas and they have later spread toward the city. This is most striking for it is usually assumed that urban areas are the loci of innovative phenomena. The contribution of social status to velarization explains how the process is being assimilated into the grammar of the community. Velarization is shown to be promoted by the middle status groups in the city, more so than highest and lowest status groups. This curvilinear pattern replicates patterns of social involvement with on-going sound changes in other communities. Labov, Yagser and Steiner (1972) indicate that middle groups, either upper working class or lower middle class speakers, in New York, Detroit and Norwich were found to be the major vehicles of the on-going sound changes which they investigated. Both the upper middle class, which is sensitive to corrective pressures of the standard language, and the lower class tend to be more conservative in their linguistic behavior. The data for velarization confirm the generality of this sociolinguistic tendency, for although

the process is not of urban origin, it is obvious that the pronouns of the rule are the middle status groups, in particular the upper working class subjects with p(G) = .63.

The effect of social status on effacement is linear, rather than curvilinear. The lower groups are more favorable to the phenomenon than the higher groups. This is also consistent with the social stratification of other deletion processes in the dialect. In Cedergren (1973b) cases of /l/, /s/ and /d/ deletion were also found to be strongly favored by the lower status groups.

The third social factor, age of speakers, is relevant for determining the pathway along which nasalization is generalized in the grammar. The probability of velarization increases for each successive age group with an overall range of .26. In contrast, effacement appears not to be affected by the age of the speakers; the range is only .05.

3.3. The relation between the types of vowel preceding the nasal and the effacement of the nasal consonant was also investigated for this sample of seven speakers. Five relevant parameters of the vowels were studied: the features High, Low, Back, Round and Stress.

The data coded for each of these factors were used to estimate the effect of vowel features on effacement: high = H, low = L, back = B, round = R, stress = S, stress = U. The results displayed in Table 4 show that the height of the preceding vowel is a factor worthy of note. High vowels, H, strongly favor effacement, p (high) = .73, whereas both mid and low vowels have an inhibiting effect on the rule. On the front-back dimension, B favors deletion, stress has negligible effect on effacement.

In essence, this means that in articulatory terms, effacement is favored by a high tongue position and by the retraction of the body of the tongue.

TABLE 4. FACTOR VALUES FOR FEATURES HIGH, LOW, BACK AND STRESS CONSTRAINTS ON EFFACEMENT

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>H</th>
<th>L</th>
<th>R</th>
<th>B</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>.90</td>
<td>.73</td>
<td>.40</td>
<td>.55</td>
<td>.52</td>
<td>.49</td>
</tr>
<tr>
<td>Y</td>
<td>.27</td>
<td>.60</td>
<td>.45</td>
<td>.48</td>
<td>.50</td>
<td></td>
</tr>
</tbody>
</table>
Finally, rule (13b) may be revised as follows:

(15) \(+\text{nasal}\) \(\rightarrow\) \(\langle p \rangle\) / \(+\text{nasal}\) \(\langle c \rangle\)

\(+\text{high}\) \(\langle \text{low}\rangle\) \(+\text{round}\) \(+\text{back}\) \(+\text{stress}\)

4. The statistical analysis confirmed that velarization and effacement are separate rules favored by different hierarchies of the linguistic factors. However, these two rules are closely related; they have not been added to the grammar independently. They are both reflexes of a unitary process of nasal reduction affecting final nasal segments. The process, as it appears in PANAMANIAN SPANISH, does not differ significantly from other instances of nasal reduction reported for other languages. Chen (1973) for CHINESE and Foley (1973) for ROMANCE, both show that the attrition of nasals followed the pathway of \(m > n > \eta > o\).

The fact that both velarization and effacement have a single local source in Panama provides additional evidence for the claim that nasal reduction is a unitary functional process. Both rules are promoted by informants of rural origin.

Earlier descriptions of PANAMANIAN SPANISH provide independent evidence that these rules are on-going processes of change. Robe's (1960) description of the SPANISH of rural Panama, based on data collected during the early 1940's, refers to the free alternation of final \(\langle a \rangle\) with \(\langle \eta \rangle\), and claims that nasal effacement is only sporadic. Ricord (1971), whose data base was collected during the 1960's and who primarily describes the speech of educated speakers in Panama City, says that velarization occurs only before \(/\text{a/}, /\text{i/}, /\text{u/}, /\text{n/}\) and \(/\text{m/}\) within the word, on prefixes and across word boundary before vowels and \(/\text{m/}\). Effacement is mentioned as a characteristic of lower class speakers, and is limited to word final position before an initial \(/\text{n/}\).

The data on which we have based our analysis were gathered in 1969, some 30 years after Robe's fieldwork and only a few years after Ricord; but they are fundamentally different. They consist of samples of recorded speech from all social levels of Panama City.

The results of our analysis prove that effacement is no longer sporadic in the dialect and that it is not limited to preconsonantal environments.
FIGURE 1. A TWO DIMENSIONAL CONFIGURATION OF 62 SPEAKERS FROM PANAMA CITY.

Top: Dimension 1. Age group by origin.
Bottom: Dimension 2. Class by origin.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large hexagons</td>
<td>Speakers arriving at age 20 or later</td>
</tr>
<tr>
<td>Small hexagons</td>
<td>Speakers arriving as adolescents</td>
</tr>
<tr>
<td>Small circles</td>
<td>Childhood arrivals</td>
</tr>
<tr>
<td>Large circles</td>
<td>Speakers native to the city</td>
</tr>
<tr>
<td>Filled shapes</td>
<td>51 and older, or lower class</td>
</tr>
<tr>
<td>Half-filled shapes</td>
<td>36-50 years, or working class</td>
</tr>
<tr>
<td>Striped shapes</td>
<td>21-25 years, or lower middle class</td>
</tr>
<tr>
<td>Empty shapes</td>
<td>14-20 years, or upper middle class</td>
</tr>
</tbody>
</table>
4.2. Although the rules for nasal reduction in Panama are clearly ordered stages of a single dynamic process, the social parameters of velarization appear to be different from those of effacement. To examine this statistically we use a procedure known as multidimensional scaling (Sankoff and Cedergren, 1974). By comparing each pair of speakers according to their behavior in various environments, an overall measure of distance between speakers is constructed. Only 62 of the original 79 speakers are used because of computer storage limitations. A two-dimensional configuration of 62 points corresponding to the speakers is constructed in a way as consistent as possible with these distances. The first dimension appears to rank speakers according to a combination of age group and local origin, as depicted in Figure I (page 77). The second dimension categorizes speakers according to a combination of age and social status.

The two dimensions confirm the variable rule analysis in section 3. The first dimension is consistent with velarization and reflects the significant social parameters of the rule which are age and duration of residence in the city. The second dimension appears to be related to nasal effacement with local origin and class as the relevant social effects.

5. Conclusions. This study has provided an empirical account of nasal reduction in PANAMANIAN SPANISH, and it has shown that the patterning of nasal reduction in this dialect is consistent with general tendencies that have been proposed for nasal weakening processes from the examination of diachronic data (Polley, 1972; Chen, 1973). The data we have discussed provide independent support for the claim that nasal reduction proceeds along a dimension of tongue retraction, and that syllable final nasals are subject to weakening. Finally, this study demonstrates that linguistic and social processes are essentially independent. Whereas nasal reduction is a unitary linguistic phenomenon, the social implementation of the phonological process is not unitary.

FOOTNOTES

1. Research for this paper was partially supported by the Canada Council under grant W746537. We would like to thank James Harris, Paul Kiparsky, John Mascaré, Alan Prince and Alberto Rivas with whom we have discussed parts of this paper.

2. The forms cited for PANAMANIAN SPANISH are representative of casual speech. The proportionate use of the different alternants may vary from speaker to speaker and is correlated with the social characteristics of the speakers.

3. In PANAMANIAN SPANISH, CH[ɛ] alternates with [ʃ]. This is a recent sound change in the dialect. In Cedergren, 1973a, 1973b, we discussed the social and linguistic constraints of this sound change.

4. Sequences of N + velar consonants can only exhibit two alternants. Among the continuants there is a small difference in the distribution of the velar variant. All speakers have [ɛ] in alternation with other forms when the preceding vowel is unstressed. Speakers vary in the use of [ʃ] after stressed vowels.

5. In Cedergren, 1973 we used a different model for estimating the constraint effects on velarization and effacement, of the form:

\[ p = 1 - (1 - p_1) \times (1 - p_2) \times (1 - p_3) \ldots \]

This is a multiplicative non-applications probabilities model. The values assigned to \( p \) vary between 0 and 1, where 0 represents a feature value having least effect on the probability of rule execution. The effects of sex, age, socio-economic status, local origin and style were correlated separately with the linguistic constraints. In each and every case the analysis revealed that the linguistic factors did not interact with the social parameters. The consistency of the linguistic effects were revealed in the values assigned to C, V and P for each model.

<table>
<thead>
<tr>
<th>Velarization</th>
<th>Effacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>V</td>
</tr>
<tr>
<td>style</td>
<td>0</td>
</tr>
<tr>
<td>sex</td>
<td>0</td>
</tr>
<tr>
<td>age</td>
<td>0</td>
</tr>
<tr>
<td>status</td>
<td>0</td>
</tr>
<tr>
<td>origin</td>
<td>0</td>
</tr>
</tbody>
</table>

6. An inspection of Ricord's data reveals that velarization is less restricted than she claims. There are examples of [ɛ] before [ʃ][i] internally: [ɾaʃ 30], [koʃ yuʃ]. Across word boundary there are examples such as: e ɲɛ ɾealistad (p. 86), hαιd terminado (p. 87), e ɲɛ su casa (p. 89).
REFERENCES


AN AREAL STUDY OF NASALIZATION IN CHINESE

Matthew T. Chen
University of California, San Diego

A modest term paper on nasal finals I attempted in 1968 somehow grew into a bulky Ph.D. dissertation (Chen 1972a). Some of the findings have been reported in a number of articles (Chen 1972b, 1973a, b and Chen and Wang 1975); but a full documentation has never been made public. In the meantime, new evidence has been accumulating from a broadened survey of the rich dialectological literature that already exists, if only partly in print. Concurrently, a number of studies bearing on the topic of nasalization from the viewpoint of substantive language universals appeared. Among these I wish to mention especially Lightner 1970, Rochet 1970, Schuurup 1972 and 1973, Foley 1972, Hymes 1972, Robb 1973 and 1974, Ferguson 1974, Hatt 1974, and the experimental investigations carried out by Ohala 1972 and Clumbeck 1973. The lively interest on nasalization as a universal process was amply demonstrated by the active participants at the 'Nasalifest', a symposium which took place on November 23-24, 1974 at Berkeley. The 'Nasalifest', gentle nudgings from interested friends, and delays in the publication of my dissertation, prompted me to afford my fellow researchers in the field a timely glimpse of the full range of data that exist in CHINESE dialectology in the hope of furthering the on-going dialogue on many fronts centering on nasals and nasalization as a language universal phenomenon. In these pages I will give more weight—and most of the space—to the new evidence not yet reported either in my unpublished dissertation or in any of the Western languages.

But first, a word about China as a linguistic area.

1. China as a Linguistic Area

1.1. The Yangzi (or Yangtze) River has served traditionally as a geopolitical, cultural, as well as linguistic demarcation between the North and the South. The North, comprising about 70% of the population and even larger proportion of the territory, speaks the various types of MANDARIN. MANDARIN, also known as 'guanhuá', i.e. the official or 'forensic' language, is subdivided into the Northern, Northeastern, Southwestern and the Southeastern (or Xiang) branches according to their

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