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IN LINGUISTICS**

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# TSING HUA WORKING PAPERS IN LINGUISTICS

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# Contents

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What does the Emphatic Word Right Modify?		
	Yuh-Huey Lin	1
Loanwords and the Psychological Reality of Phonological Theories		
	Wen Hsu	35
The One-Step Principle as a Derivational Constraint in Some Chinese Dialects		
	Hui-Chuan Hsu	61
Dialect Mixture--A Case Study of the Initial System of the Jianyang Dialect		
	Hui-Li Hsu	85
The Aspiration of Qie-Yun Voiced Plosives		
	Hui Ying Liu	117

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# What does the Emphatic Word *Right* Modify?

Yuh-Huey Lin

## 0. Introduction

The English word *right*, as stated in Webster's New Twentieth Century Dictionary, can be used either as an adjective (meaning 'true, correct, straight, appropriate'), a noun ('that which is good, just, honorable, true', etc.) or an intensifying, emphatic adverb ('straight, directly, all the way, completely, thoroughly, precisely'). The distribution and position in the phrase structure of this last use are our main concern in this paper.

Like other intensifiers such as *very*, *indeed*, *so*, *just*, etc., the emphatic *right* modifies a limited set of items, and is restricted in its distribution as exemplified below in (1)<sup>1</sup>:

- (1) a. Put it *right* in the middle.
- b. The wind was *right* in our faces.
- c. Go *right* to the end of this winding road, and then turn left.
- d. He slipped *right* to the bottom of the icy slope.
- e. There's a veranda *right* round the building.
- f. He fell *right* off the bed.
- g. Do it *right* after lunch!
- h. He went *right* before you arrived.
- i. John finished his homework *right* before.

- j. *right* now!
- k. I found it *right* here.
- l. I'll be *right* there.
- m. He arrived *right* then.
- n. The pear was rotten *right* through.
- o. The prisoner got *right* away.
- p. He turned *right* round.
- q. Go *right* in!

As can be seen in (1), *right* is a premodifier. But what does it premodify, i.e., what is the categorial status of the element(s) following the premodifier *right*? Do they belong to different categories or can we combine them into a single category? Different linguists have provided different answers to this question, and it is the aim of this paper to work out a unified, explanatorily adequate account for this issue within the framework of X-bar theory. In what follows, we would first examine the various explanation concerning this topic in the literature, then present our analysis, and finally give theoretical as well as empirical supports for our proposal.

## **1. Literature Review**

### **1.1. Emond's remarks**

In his article Evidence that Indirect Object Movement Is a Structure Preserving Movement (1972), Emonds adopts *right* as a diagnostic for the syntactic category Preposition. Thus he notes: "*right* modifies only prepositions of space and time, but not other syntactic categories such as adjectives, adverbs, modals, etc." (p.551) The examples he gives are:

What does the Emphatic Word *Right* Modify?

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(2)

- a. \*Bill visits Europe *right* often, frequently, etc.
- b. \*Fights happened *right* seldom in that town.
- c. \*Those girls were *right* attractive.
- d. \*A proposal of that sort seems *right* unjust, wise, etc.
- e. \*He ironed his shirt *right* wet.
- f. \*Some *right* ignorant students asked those questions.

(3)

- a. Make yourself *right* at home.
- b. We went *right* along that road.
- c. Bill put the spices *right* on the meat.
- d. He lives *right* up the street.
- e. Some people can't work *right* before dinner.

(4)

- a. John came *right* in.
- b. He put the toys *right* back.
- c. Go *right* on to the stoplight.
- d. They looked it *right* up and left.
- e. John brought the bottles *right* down.

In (4), the post-verbal particles are analyzed as 'intransitive prepositions.'<sup>2</sup>

Based on this criterion, Emonds further argues that items like *before* and *now* are also 'intransitive prepositions' in English<sup>3</sup>:

(5)

- a. John finished the task *right before*.
- b. You should do this *right now*.

## 1.2 Quirk's explanation

Unlike Emonds, who combines prepositions and post-verbal particles into a single category by arguing that post-verbal particles are 'intransitive prepositions,' Quirk et. al (1985) treat them separately. In introducing the intensifier *right*, they remark: *right* "premodifies particles in phrasal verbs as well as prepositions, or (perhaps rather) prepositional phrases" :(p. 449)

(6)

- a. He knocked the man *right* < out >.
- b. The nail went *right* < through > the wall.

## 1.3 Swan's characterization

Both Emond's and Quirk's classifications of the elements premodified by *right* remain in word-level category. Swan (1985) brings them to a phrase-level category: "*right* is used as an adverb before prepositional phrases to mean 'just, exactly' or 'all the way.' (p.12) Some examples are:

(7)

- a. She turned up *right* after breakfast.
- b. The snowball hit me *right* on the nose.
- c. Keep *right* on to the traffic-light.

However, like Quirk, she gives no account for the status of items such as *now* and *here* which also occur after *right* as exemplified in (1.j) and (1.k) repeated here:

(8)

- a. *Right* now!
- b. I found it *right* here.

#### 1.4. Fraser's remarks

In his discussion on the verb-particle constructions, Fraser (1976) indicates that particles can be preceded by *right*: (p.25)

(9)

- a. I'll look the information *right* up.
- b. The iron pier rusted *right* sway.
- c. The student figured the problem *right* out.
- d. The plane took *right* off.

However, Fraser defines the *right* in this construction quite differently from others. For him, the formative *right*, which occurs immediately before the particle, is a 'reduced form' of *right away*, which is a time adverbial. The reason that Fraser gives for the above statement is that only in sentences where the adverbial *right away* can follow the verb-particle combination can *right* occur before the particle. cf.:

(10)

- a. \*They held the movie over *right away*.  
\*They held the movie *right* over.
- b. \*John has spelled Mary down *right away*.  
\*John has spelled Mary *right* down.
- c. \*One cannot eke out a living *right away* in the desert.  
\*One cannot eke *right* out a living in the desert.
- d. I'll look the information up *right away*.  
I'll look the information *right* up.
- e. The iron pier rusted *away right away*.  
The iron pier rusted *right away*.

Such a generalization seems quite odd, however, since even if it holds in the verb-particle construction, it would fail in sentences

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such as those in (11), as the ungrammaticality of (12) indicates:

(11)

- a. The book is *right* here.
- b. I found it *right* before you came.
- c. There is a line *right* in the middle of this page.

(12)

- a. \*The book is here *right away*.
- b. \*I found it before you came *right away*.
- c. \*There is a line in the middle of this page *right away*.

### 1.5 Radford's illustration

In arguing for word-level category, Radford (1988), following Emonds, uses the emphatic *right* as a diagnostic for the category *Preposition*. Like Emonds, he states that prepositions alone can be premodified by *right* but other categories cannot: cf.

(13)

- a. Go *right up* the ladder
- b. He fell *right down* the stairs
- c. He arrived *right* on time
- d. It's *right under* the bed
- e. I'm *right out* of matches

(14)

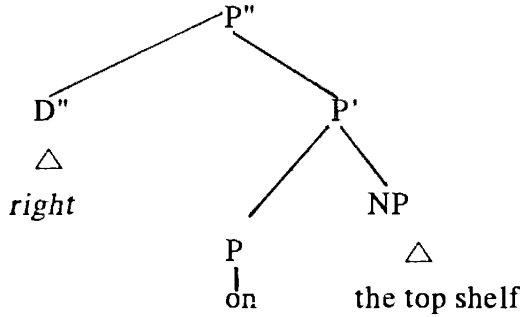
- a. \*He *right* *despaired* [Verb]
- b. \*Life *right* *can* be cruel [Modal]
- c. \*She is *right* *pretty* [Adjective]
- d. \*She looked at him *right* *strangely* [Adverb]
- e. \*She chooses *right* *this* one [Determiner]

However, when giving evidence for prepositional phrases, he

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revises his earlier statement and says that *right* is the Determiner of P-bar: (p.246)

(15)



The evidence that Radford gives for postulating a P' (P-bar) comes from the pro-form *there* which he claims is a pro-P'.(p.247) cf:

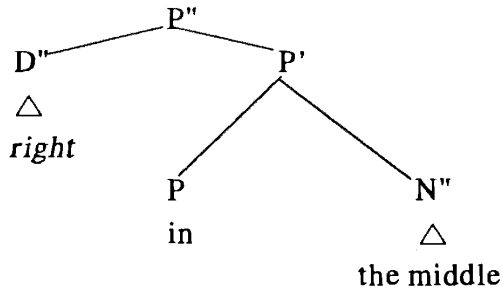
(16) Put it [*right there*]

### 1.6 Towards an explanatorily adequate generalization

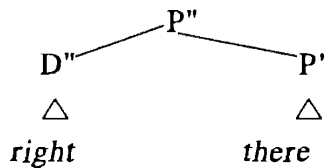
To be explanatorily adequate and thus be able to account for the rapidity of language acquisition, a rule must be maximally constrained and yet be general enough. However, none of the explanations discussed above satisfy this requirement. For one thing, though Emonds tries to posit a generalized account for the elements modified by *right* by saying that they are all Prepositions, he does not even reach descriptive adequacy since it is against native speaker's intuition to say that *now* is a preposition. Besides, it is obvious that both Quirk's and Swan's remarks are not general enough since neither of them mention the pro-forms (eg. *now*, *there*) which can also be modified by *right*. Finally, Radford's classification is not consistent in that he uses *right* as a diagnostic for both prepositions and P-bar.

To solve the above problems and reach explanatory adequacy, we posit a generalized account for this use of *right* -- the emphatic *right* premodifies localive or temporal P-bar, i.e., the prepositional phrases (such as those in (1 a--i)), the pro-forms *now*, *then*, *there*, *here*, (1 j-m), and the post verbal particles (1 n-q) , as opposed to Emonds' zero-bar analysis, all belong to the single-bar-level category P-bar (P'), and the premodifier *right* is the P Specifier which expands P' into P'' (P-double-bar) as shown in the trees below:

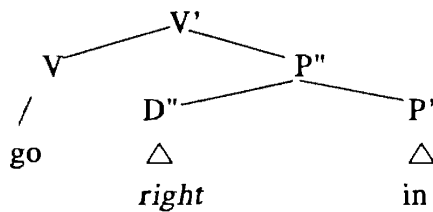
(17) a. P': prepositional phrase



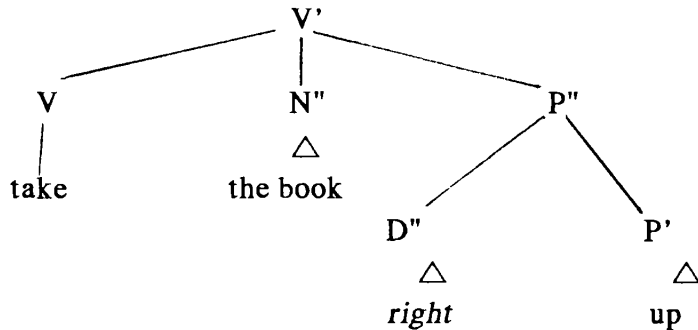
b. P': there--pro-P'



c. P': post verbal particle in intransitive phrasal verb



d. P': post verbal particle in transitive phrasal verb



(We follow Radford's classification that all intensifiers are determiners. Thus D'' is the maximal projection (assuming modifier maximality principle) of the category Determiner.)

In the following pages, we would give empirical evidence in support of this P-bar analysis. The theoretical background is Chomsky's X-bar Syntax, and the methodology and diagnostics are adopted from Radford (1988).

## **2. The Prepositional Phrases that right premodifies is a P-bar**

### 2.1 Evidence for P-bar

In this section, we would prove that the prepositional phrases modified by *right* in the following sentences are P-bar, which is larger than P and smaller than P-double-bar:

(18)

- a. Put it *right* in the middle.
- b. The wind was *right* in our faces.
- c. He slipped *right* to the bottom of the icy slope.

The first piece of evidence for the P-bar analysis comes from

Coordination facts. In (19) below,<sup>o</sup> the two prepositional phrases (P') can be conjoined:

(19)

- a. John fell  $p_p$ ·[off the bed] and  $p_p$ ·[ onto the floor].
- b. The book is  $p_p$ ·[on the table ] or  $p_p$ ·[in your bookbag]<sup>4</sup> .

and the resulting coordinated P' can be modified by *right*:

(20)

- a. John fell  $p_p$ ··[*right* $p_p$ ·[off the bed] and  $p_p$ ·[onto the floor]]
- b. The book is  $p_p$ ··[*right* $p_p$ ·[on the table] or  $p_p$ ·[in your bookbag]]

Another evidence for the P-bar analysis is a Pronominalization one. As Radford postulates (p.25), the P-bar [on the top shelf] in the structure [*right* [on the top shelf]] can be replaced by the *locative pro-p-bar* constituent *there*:

- (21) Put it [*right* [on the top shelf]]  
= Put it [*right* [*there*]]

What's more, if we assume the P-bar status, we might expect to find that, like other single-bar constituents such as N-bar, A-bar, and V-bar, which can be extended into another constituent of the same level by the addition of adjuncts ( $n_n$ ·[king of England] -->  $n_n$ ·[competent  $n_n$ ·[king of England]],  $a_a$ ·[fond of Mary] -->  $a_a$ ·[very  $a_a$ ·[fond of Mary]],  $a_a$ ·[buy the book] -->  $a_a$ ·[ $a_a$ ·[buy the book] on Tuesday]), a P-bar too can be expanded into another P-bar in like manner:

(23)

- a. He is  $p_p$ ·[in the wrong]
- b. He is  $p_p$ ·[completely  $p_p$ ·[in the wrong]]
- c. He is  $p_p$ ·[[in the wrong] completely]

However, some problems arise concerning the P-adjunct. In the structure in (24) below, the PP's [up] and [down] are analysed as Specifier of PP by Radford (ibid. p.251):

(24)

- a. I found it<sub>pp</sub> [up] in the attic
- b. You must have left it<sub>pp</sub> [down] in the cellar

Yet, though we can replace the bracketed PP's by *right*, which we posit as the P'-specifier:

(25)

- a. I found it *right* in the attic.
- b. You must have left it *right* in the cellar.

we can also directly attach *right* to them as shown in (26) below:

(26)

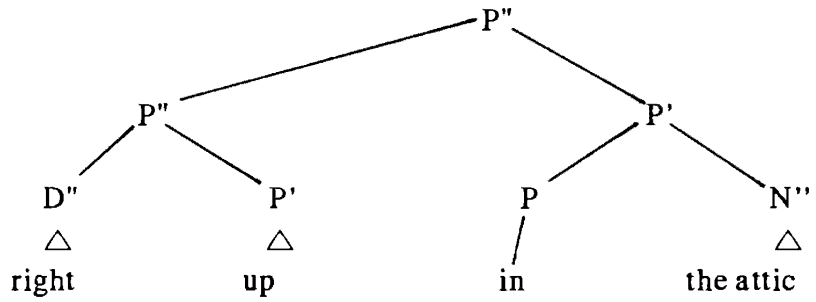
- a. I found it *right* up in the attic
- b. You must have left it *right* down in the cellar

Since the the neutralized rule schema in the X-bar theory states that Specifiers cannot recur, *there* must be something wrong with Radford's remark that the PP's [up] and [down] are P-specifiers in (25).

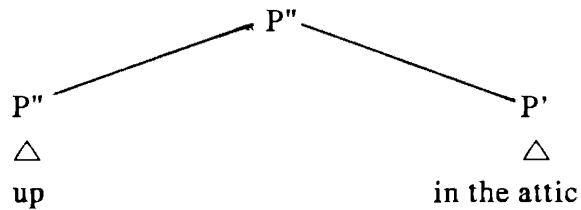
Two alternative structures can be postulated for these problematic PP's *up* and *down* in (26). One is to retain their Specifier status, i.e., the specifier *right* extends the P' *up* and *down* into a P''<sub>p</sub> [*right*<sub>p</sub>, [up]], <sub>p</sub>'' [*right*<sub>p</sub>, [down]] which in turn, specifies the P'<sub>p</sub>, [in the attic] and <sub>p</sub>' [in the cellar] and expands them into a P'' as illustrated in the tree structures (27) below:

(27) a.

i. with *right*

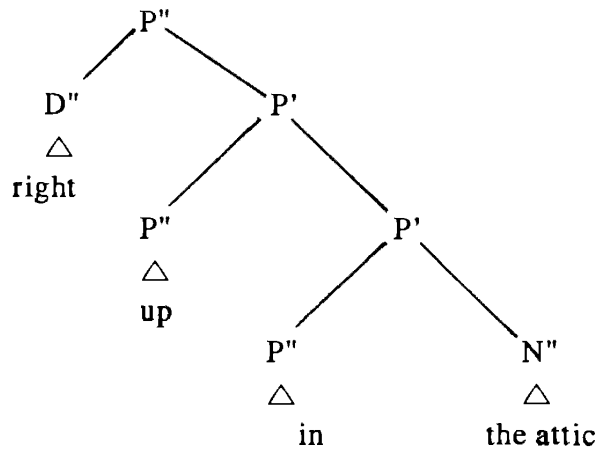


ii. without *right*



Another postulation is to treat the PP's in question as the PP adjunct which expands the P' [in the attic ] and [in the cllar] into another P'

(28) a.



At first glance, it is difficult to decide which of the two is the better analysis since both of them agree with the X-bar neutralized categorial rule schema. However, we have some empirical evidence in support of the second analysis, the one given in (28). We can give at least the following argument in support of this analysis.

The first argument is an *Ordinary Coordination* one which states that only constituents of the same category can be conjoined. As shown in sentences below, only (28) but not (27) can account for the grammaticality of (29) in which [up in the attic] and [down in the cellar] are conjoined since only in (28) do they belong to the same category (P').

(29)

- a. The vase could be *right*<sub>P</sub>·[up in the attic] or  
<sub>P</sub>·[down in the cellar]
- b. Go *right*<sub>P</sub>·[up in the attic] or <sub>P</sub>·[down in the cellar]

Another coordination argument in favor of the (28) structure concerns sentences such as the following:

(30)

- a. Is the vase [in the cellar] or [up in the attic]?
- b. John may be [there] or [down in the cellar].

Again, only (28) can account for (30) in which [in the cellar] and [up in the attic] are conjoined since only in (28) are they of the same category P', whereas in (27), one is P' and the other P". What's more, assuming Radford's claim that *there* is a locative pro-P', then only (28) in which [up in the attic] is a P', but not in (27) where it is a P", can it be the *right* structure for (30.b) where the pro-P' *there* is conjoined with [up in the attic] .



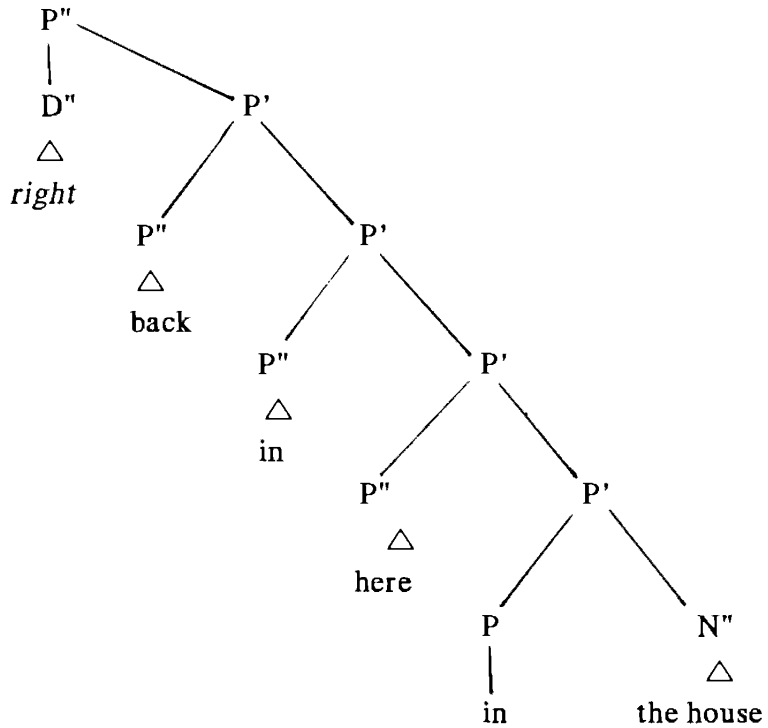
Furthermore, such an adjunct analysis has some theoretical support. Since only Adjuncts can recur and can be stacked, it is the adjunct analysis (28) which best accounts for the motion phrases in (31) below: (from Baker 1988 p.151)

(31)

- a. *right* back out *here* in the yard
- b. ----- back in *here* in the house
- c. *right* ---- up *here* in the shelf
- d. ----- ---- out *there* in the pasture
- e. *right* ---- --- *there* in the refrigerator
- f. ----- ---- --- *here* in the yard
- g. *right* back --- *there* under the cottonwood
- h. ----- back --- *here* in the kitchen
- i. *right* back up ---- in the attic
- j. ----- back down ---- in the cellar
- k. ----- back ---- ---- in the yard
- l. *right* back in *here* ----
- m. *right* back ---- *here* ----
- n. *right* ---- ---- *here* ----

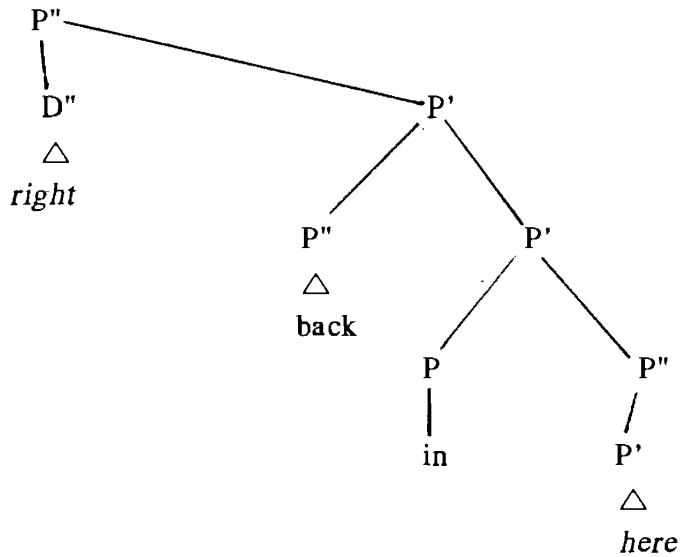
With the adjunct analysis (28), we can simply posit that all the phrases in (31) are P-double-bar's with the optional specifier *right*. From (a--k), the final prepositional phrases are P-bar's which are recursively expanded into another P' by the addition of P'' adjuncts such as *here*, *in*, *back*, *up*, etc. as illustrated in the tree diagram (32):

(32)



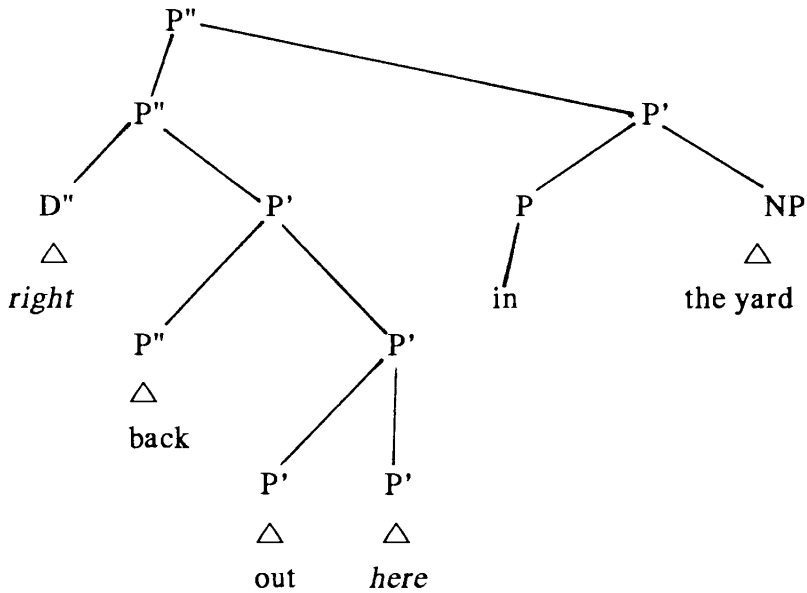
And from (1-n), *here* is the pro-P', which is also recursively extended into another P' by adjuncts:

(33)



However, contrary to (28), the Specifier analysis (27) would cause great complexity in the Specifier position concerning the constructions in (31). For instance, the phrase (31a) would be analyzed as (34) below:

(34)



in which the structure of the Specifier finds no relevance in the X-bar syntax –Specifiers usually do not allow stacking of elements belonging to the same category, and which cannot show the whole phrase [out here in the yard] as a single constituent as indicated in (35):

- (35)a. You can find him either *right* [in *here* in the kitchen] or [out *there* in the yard].
- b. A: Is John [out *there* in the yard]?  
 B: Yes, he is *right* [here].

To conclude, in constructions where more than one PP appear

## What does the Emphatic Word Right Modify?

after the emphatic *right*, only *right* is the Specifier, and all the PP's should be regarded as Adjuncts which are optional and can undergo recursion.

### 2.2. before and after are Prepositions

Having confirmed the categorial status of the prepositional phrases which occur after *right* as P-bar, and discussed some relevant problems raised in the argument, we would *now* turn to another type of elements modified by the intensifying *right*. To begin with, recall the sentences in (1.g--i) repeated *here*:

(36)

- a. Do it *right* after lunch.
- b. He went *right* before you arrived.
- c. John finished his work *right* before.

The terms *before* and *after* are traditionally analysed as *Conjunctions*. However, Emonds (1976, 1976) treats them as *prepositions* which may be subcategorized as:

(37)

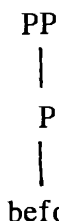
*before*

P, +\_\_ ((NP,S))

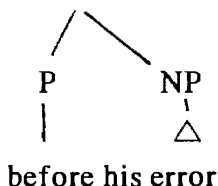
*after*

i.e. they can be either transitive taking NP or S as complements or intransitive with no complement.

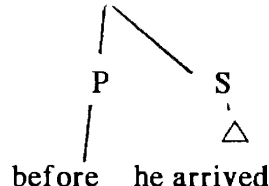
(38) a.



b. PP



c. PP



Such a Preposition analysis is supported by Radford in his discussion

about conflating the traditionally differentiated categories Prepositions, (Subordinate) Conjunctions, and Particles into a single category *Preposition* in structures such as the following:

(39)

- a. I'd never met her [before the party] (Prep)
- b. I'd never met her [before you held your party] (Conj)
- c. I'd never met her [before] (Part)

(40)

- a. You can have some chocolate [after your dinner]  
(Prep)
- b. You can have some chocolate [after you've eaten]  
(Conj)
- c. You can have some chocolate [after] (Part)

Two major pieces of evidence are given for the analysis. The first comes from analogy with Verbs, and the reason is that some Verbs can also be used transitively, taking NP complement (41.a), clause complement (41.b), or intransitively with no complement (41.c):

(41)

- a. I don't know the answer.
- b. I know you are innocent.
- c. I don't know.

With the parallel between the three uses of prepositions *before*, *after* and those of verbs like *know*, Radford argues that just as some verbs have these three different uses, so do prepositions such as *before* and *after*. In the light of the analogy, we can say that *before* and *after* in (39) and (40) are Prepositions which take an NP complement in the (a) sentences, a clausal complement in the (b)

sentences, and no complement at all in the (c) sentences.

The second piece of evidence for the Preposition analysis comes from the fact that in all the three uses, Prepositions permit precisely the same range of premodifiers: (p. 135)

(42)

- a. He'd been feeling unwell a couple of weeks before his collapse [Prep]
- b. He'd been feeling unwell a couple of weeks before he collapsed [Conj]
- c. He'd been feeling unwell a couple of weeks before. [Part]

(43)

- a. There was a drugs raid *immediately* after the party. [Prep]
- b. There was a drugs raid *immediately* after the party began [Conj]
- c. There was a drugs raid *immediately* after. [Part]

Aside from the two arguments from Radford, we have further empirical support for the Preposition analysis.

First of all, concerning *Distributional* facts, phrases headed by *before* or *after* have the same distribution as other prepositional phrases:

(44)

- a. He came here *in the morning / after lunch / before I returned / before / after*
- b. John is standing *on the stage / before the blackboard / after me / before / after*.

In addition, *before* and *after* phrases can be coordinated with other prepositional phrases (45a, b), and when conjoined, they can together be modified by *right* (45c).

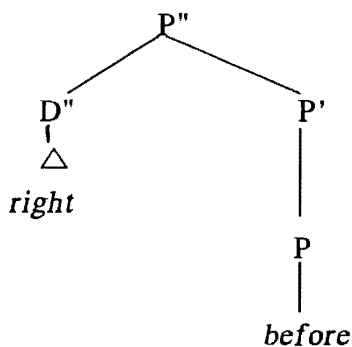
(45)

- a. He will come [in the morning] or [after lunch].
- b. You can find the pot [before the gate] or [in the basement].
- c. You can find the pot *right* [before the gate] or [in the basement].

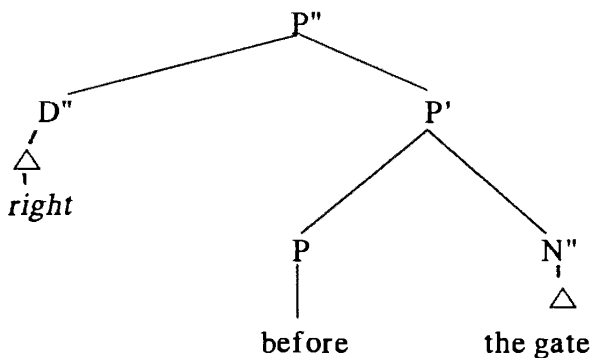
Having proved that prepositional phrases premodified by *right* are P-bars in the previous section, we may draw the conclusion that phrases headed by *before* and *after* are prepositional phrases which belong to the single-bar-level category -- P-bar, and that the Specifier *right* which premodifies the P-bar expands it into a double-bar level category as demonstrated in the tree diagrams in (46):

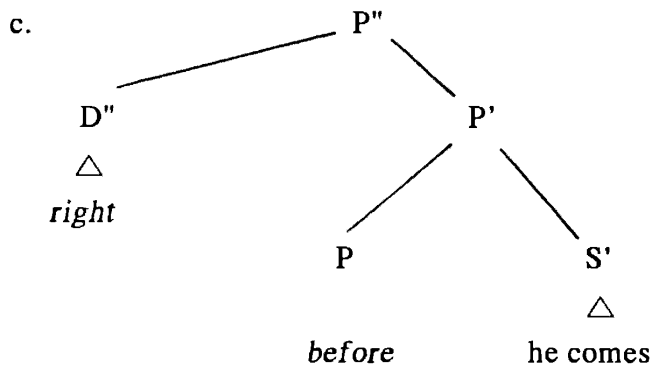
(46)

a.



b.





### 3. Now, Then, Here, There Are Pro-P-Bar's

Besides prepositional phrases, another type of items which can be premodified by the emphatic *right* are the pro-forms *now*, *here*, *then*, and *there* as in (1. j-m) repeated *here*:

(47)

- a. *Right now!*
- b. I found it *right here*.
- c. I'll be *right there*.
- d. He arrived *right then*.

These items are traditionally termed as *spatial* and *temporal* pro-forms (Quirk 1985).

In this section, we will prove that like the PP's premodified by *right*, these pro-forms are of the single-bar-level category, i.e., they are temporal and locative P-bar's.

In the ensuing paragraphs, we will first clarify the categorial status of *now*, which is mistakenly interpreted as *intransitive preposition* by Emonds (1972), *then* proceed to prove the pro-P' analysis of the relevant pro-forms.



### 3.1 Now is not a preposition

Recall that in 1.1, we have mentioned Emonds' interpretation of the word *now* that like post-verbal particles, *now* is an intransitive preposition which can be premodified by *right*:

(48) You should do it right *now*.

Is *now* really an intransitive preposition? We have empirical evidence to disprove such a zero-bar classification and to argue that in fact, it is of a phrase-level category.

The first argument in support of the phrase-level analysis is a *Movementone* which states that only phrasal constituents can undergo *Preposing* or *Postposing*. In the light of this criterion, consider the following constructions:

(49)

- a. Where are you living *now*?
- b. *Now* where are you living?
- c. He said he would come *now*, and *now* he comes.

The fact that *now* can be preposed both in (49) thus suggests that *now* is a phrasal constituent.

Moreover, the *Sentence Fragment* argument also provides empirical evidence for the phrase-level analysis as we see from (50) below where the word *now* can serve as sentence fragment:

(50)

- a. A: When will you go to Taipei?  
B: *Now*.
- b. A: When did he say he would come?  
B: *Now*.

Since only phrasal constituents can serve as sentence fragments,

---

this again confirms the phrase-level categorial status of the item *now*.

The third argument comes from the *Coordination* facts. Given our assumption that *now* belongs to a phrase-level category, we should expect that it can be coordinated with another phrase of the same type, and this is exactly the right prediction as the grammaticality of (51) below illustrates:

(51)

- a. Shall we go *now* or *after* dinner?
- b. Either *now* or *tomorrow morning* will be fine.

The final piece of evidence in support of our phrase-level analysis of *now* is the *Shared Constituent Coordination*, a construction in which only a phrasal constituent can function as a 'shared constituent'. Since *now* as we see from (52) below can function as a shared constituent in this construction, it must be a phrasal category.

(52)

- a. I am going out—and he is coming back—*now*.
- b. Are you doing your homework —or are you watching TV —*now*?

Thus all the relevant criteria for testing phrase-level constituents prove the phrase-level categorial status of the item *now*.

### 3.2. the pro-P-bar analysis

As indicated in the above argumentation, the pro-form *now*, instead of being an intransitive preposition, belongs to phrase-level category which may also be true of other related pro-forms *here*, *there*, and *then* as the *Coordination* facts in (53) below indicate:

(53)

- a. He goes to the opera *now* and *then*.
- b. The man ate the pie *then* and *there*.
- c. He is wondering *here* and *there*.

But what do these pro-forms replace, i.e., what is the categorial status of the elements which serve as their antecedents?

For this question, recall that in section 2.1, we, following Radford, adopts *there* as a diagnostic for P-bar. In this section, we will give further empirical evidence for the pro-P-bar analysis.

First of all, concerning the *Ordinary Coordination* facts, they can be conjoined with other P-bar's as shown in (54) below:

(54)

- a. Is John *here* or *in the garden*?
- b. The book may be *up in the attic* or down *there*.

Distribution facts also confirm this pro-P-bar analysis as illustrated in (55) where these pro-forms appear where P' can occur:

(55)

- a. He was here *before noon/ then*.
- b. Mary is *in London* and John is *there* too.
- c. Mary arrived *on Tuesday* and John arrived *then* too.

Proving that the temporal and locative pro-forms which the emphatic *right* premodifies are pro-P-bar's, we again find support for our claim that *right* premodifies temporal and locative P'.

#### 4. Post Verbal Particles Modified by right Are P-bar's

The last kind of element(s) that the emphatic *right* modifies is the post-verbal particles as in (1.n-q) repeated in (56) below:

(56)

- a. The pear was rotten *right* through.
- b. The prisoner got *right* away.
- c. He turned *right* round.
- d. Go *right* in!

The verbs combined with particles are called phrasal verbs. Again, we will argue that the post-verbal particles in phrasal verbs are P' which is extended to P" by the addition of the Specifier *right*.

##### 4.1 post-verbal particles are prepositions

The so-called Post-verbal particles in phrasal verbs are traditionally viewed as Adverbs (cf. eg. Quirk et. al.(1985), Fraser(1968), Palmer (1965)), or simply as particles (Baker (1989)). However, based on *Distributional* factors, Radford (1988) argues that they cannot be adverbs because they cannot generally be replaced by Adverbs as exemplified in (57) and (58) below:

(57) He put his hat *on*. [Part] / \* *carefully* [Adv]

(58) The handle might come *off* [Part] / \* *suddenly* [Adv]

For the categorial status of the post-verbal particles, Emonds (1972, 1976) gives a convincing account --that they are *Intransitive Prepositions*. His argumentation is summarized as follows:

i.Theoretical evidence

- a.Post-verbal particles and transitive prepositions have many

members in common, for instance, *up*, *in*, *down*, *along*, *through*, *out*, etc. are at the same time post-verbal particles and transitive prepositions.

b. When such a word is used as a directional adverb, it has the same intrinsic meaning whether or not it has an object:

(59)

- a. go *up* the hill ([+\_\_NP])
- b. take the book *up* ([+\_\_])

c. Problems for considering P and Prt as distinct categories: Phrase structure rules such as  $PP \rightarrow \text{Prt-NP}$ ,  $PP \rightarrow P$  would formally be just as possible as  $PP \rightarrow P\text{-NP}$ ,  $PP \rightarrow \text{Prt}$ .

d.  $V_t$  and  $V_i$  (transitive and intransitive verbs) –have many members in common (Some verbs are both transitive and intransitive.)

A verb which is at the same time  $V_t$  and  $V_i$  has the same intrinsic meaning in both context. eg. begin, eat.

–have the same distribution except for the presence/absence of an object.

$\Rightarrow V_t$  and  $V_i$  are combined as a single verbal category V whose members are subcategorized to take or not to take objects.

Analogy: In like manner, we can analyze post-verbal particles as prepositions which are subcategorized 'not to take objects':

(60) PS rule:  $PP \rightarrow P\text{-(NP)}$

subcategorization: *with*, +P, +\_\_NP ([+tr])  
*in*, +P, +\_\_(NP) ([+tr])  
*apart*, +P, +\_\_ ([-tr])

ii. Distributional evidence

a. Certain verbs may or must have adverb complement of directional adverb (eg. *put, dart, glance*) and the directional adverb can only be either a prepositional phrase or a post-verbal particle.

(61)

- a. \*John put some toys.
- b. John put some toys in the garage, downstairs, away, down, together, back, out, etc.
- c. \*The children darted.
- d. The children darted outside, toward the door, in, back, off, apart, away, etc.

b. He emphatic word *right* modifies only prepositions of space and time and post-verbal particles but no other syntactic categories (as we have illustrated in 1.1. )

c. In the construction which consists of a directional adverb plus a prepositional phrase introduced by *with*, only post-verbal particles and prepositions occur *before* the *with*-NP phrase.

(62) Prepositional Phrases

- a. Into the dungeon with that traitor!
- b. out the door with it!

(63) Particles

- a. Off with them!
- b. Away with them!

d. Directional adverb preposing apply to both prepositions and post-verbal particles:

(64) Prepositional Phrases

- a. Into the house he ran!
- b. Down the street rolled the carriage!

(65) Particles

- a. In he ran!
- b. Down rolled the carriage!

#### 4.2 the P-bar analysis

Having disproved the categorial status of the post-verbal particles (so-called *here* for convenience of discussion) as Adverbs or Particles, and proved that they are intransitive prepositions, we will *now* proceed to argue that they, like the pro-forms *now*, *there*, *here*, and *there*, are in fact, of the single-bar level category, i.e., they are P-bar's.

In fact, the distributional arguments given by Emonds for the intransitive preposition analysis in (ii) above are themselves evidence for P' since the phrases headed by the transitive preposition which have the same distribution as the post-verbal particles are P-bar's which we have proved in section 2.

Other distributional facts are indicated in (66) below where post-verbal particles can be replaced by other P-bar's or pro-P-bar's:

(66)

- a. He went in / *in the room* / *there*.
- b. He got *across* / *across the river*.
- c. He came *down* / *down the hill*.

Furthermore, the fact that post-verbal particles can undergo preposing as illustrated in (ii. d) above as well as in (67) below provides further support for the P' analysis since only phrasal constituents, but not word-level categories can be preposed for emphasis:

(67)

- a. *Out* came the sun
- b. *Up* you come.
- c. *On* we drove into the light.

However, one thing should be noted concerning the preposed prepositions. Only P-bar's which involve motion can undergo preposing; hence the ungrammaticality of (68):

(68)

- a. \**Up* blew the tank.
- b. \**Up* it blew. (exploded)
- c. \**Out* he passed. (fainted)
- d. \**In* he gave. (surrender)

Note that these particles cannot be modified by *right* either<sup>5</sup>:

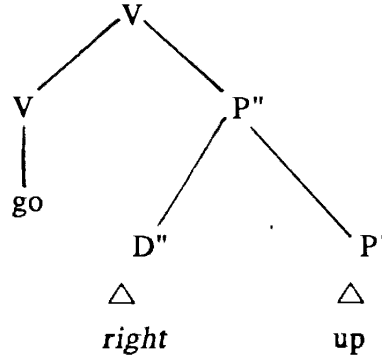
(69)

- a. \*The tank blew *right* up.
- b. \*It blew *right* up.
- c. \*He passed *right* out.
- d. \*He gave *right* in.

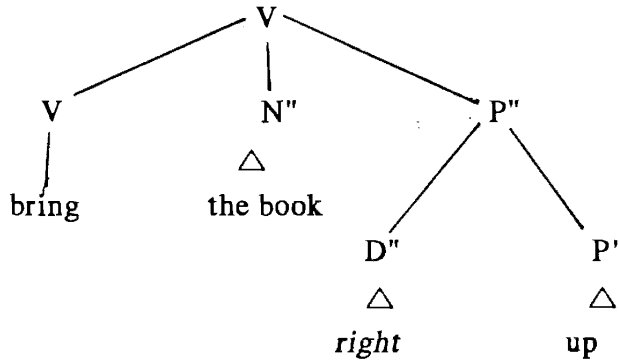
Thus with the strong empirical support for the P' analysis, we will conclude that post-verbal particles are P-bar's which are expanded into P-double-bar's when modified by *right* as shown in the structure (70) below:



(70)a.



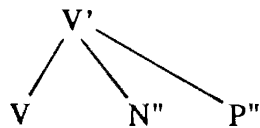
b.



### 4.3 the structure and underlying form of phrasal verb

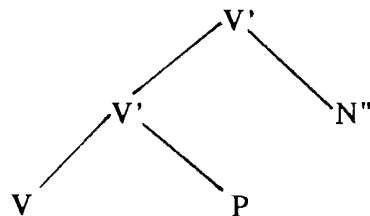
In the previous section, we have assumed the structure

(71)



as the underlying form of phrasal verbs. We have discussed the alternative analysis, as shown in (72).

(72)



Now we would like to go into the reasons for our decision.

First of all, concerning the ungrammaticality of the sentences below:

(73)

- a. \*He takes *right* off his hat.
- b. \*John turned *right* down that job.

Note that the occurrence of the premodifying *right* is possible only when the NP precedes the prepositions *off* and *down* in (73). And the underlying structure in which we can add the specifier *right* is the one in (71) which generates a P". If we assume the structure (72) as the underlying form, then an obligatory movement rule would be required whenever the premodifier *right* is added, which is an ad hoc stipulation.

Furthermore, the structure (71) satisfies the *Strict Adjacency condition* between V and its object NP in passivisation which states that only NP's which immediately follow a verb can be passivised. On the other hand, if we assume *structure* (72), then again, an obligatory rule would be needed to move the particle to the *right* of the NP. Such a rule would surely complicate our grammar, and would fail to satisfy the *maximality constraint* required by explanatory adequacy.

Above all, structure (71) gives support to Emond's (1972) and Palmer's (1968) statements that inherently, the post-verbal particles take an object like *somewhere* or *something* which is omitted in the surface structure. That is, the final P" can be understood as taking an object which is left unexpressed much as our understanding of the verb *eat* as in a sentence like "We have already eaten." The post-verbal particles can indeed take an NP object, as is shown in the following sentences.

(74)

- a. He put his hat *on / on his head*.
- b. He fell *off / off the bed*.

## 5. Conclusion

Thus far, we have provided numerous pieces of evidence in support of our claim that the emphatic word *right* premodifies a P-bar, and have thus clarified and given an explanatorily adequate account to the traditionally ununiform treatment of the particle. However, one thing should be noted that, not all P-bar's can be premodified by *right*, but only temporal and locative P-bar's can, as can be seen in the ungrammaticality of the sentences below:

(75)

- a. \*He spelled Mary *right* down.
- b. \*John gave *right* in.

Such a restriction on the use of *right* can also help to disambiguate the following ambiguous sentence:

(76) He decided *on the boat*.

Only when [on the boat] is an adjunct i.e., only when it means that "The place where he made his decision is on the boat." can it be premodified by *right*.

This temporal and locative requirement echoes the one given in (68), above which shows that only motion particles can be preposed<sup>6</sup>.

With this temporal and locative restriction as well as the P-bar analysis that we posit in sections 2, 3, and 4 above, we can now conclude and restate our thesis that the emphatic word *right* premodifies temporal and locative P-bar's.

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## Notes

- <sup>1</sup> Most of the examples used in the paper are taken from Quirk (1985), Palmer(1968), and Radford (1988).
- <sup>2</sup> This is an issue that we will take up again later in the paper.
- <sup>3</sup> We will prove later in 3.1 that now is not an intransitive preposition.
- <sup>4</sup> The P-bar's in (19a) and (19b) are of course also P" with the specifier position being empty.
- <sup>5</sup> We will give an explanation for this in section 5.
- <sup>6</sup> Based on this finding, we may further prove that motional and temporal particles are less tightly connected to their verbs than those in phrases like give in or blow up.

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# **Loanwords and the Psychological Reality of Phonological Theories**

Wen Hsu

## **1. Empirical evidence for theoretical constructs**

Linguists often seek empirical evidence to support their models of language, especially when there are different solutions to one problem. In phonology, we are not unfamiliar with the examining of psychological reality of various theoretical constructs by putting them to test through observable phenomena.

Language games are referred to in deciding which among several sets of sounds that are all in complementary distribution with the one set in question should be allophones of this set (Chao 1934). Historical changes are described by Kiparsky (1968) in a metaphor to be able to "reveal ordinarily hidden structure, as a tiger lurking on the edge of a jungle, his stripes blending in with the background, becomes visible the moment he begins to move." Speech errors have also been exemplified by Fromkin (1971) to bear witness to certain notions in phonological theory.

As for borrowing, a well-known fact present in every language, there seem to be different opinions regarding its effectiveness in proving anything significant in phonology.

## **2. An overview of borrowing as evidence**

Haugen (1950a, 1950b) believes that when a bilingual first tries to imitate a foreign word, he substitutes the "nearest native sound."

"But there is no apparent way of defining 'nearest'..." he says. "We are not yet prepared to state a measure of objective similarity which will enable us to predict the behavior of the bilingual adapter." He suggests that only the most complete structural descriptions of the borrowing language can help make the prediction. And that he thinks is not yet possible to achieve at that time.

Harms (1973) obviously agrees with Haugan in stating that beyond the fact that foreign loans must be adapted to certain surface constraints, "the process of nativization is poorly understood." He does not believe current theories of phonology, such as morpheme structure conditions (MSC's hereafter) or phonological (P) rules can explain the process. To put it the other way around, nor will loanwords justify these theoretical constructs.

The first type of opinion is therefore represented by Harms: the adaptation process of loanwords is independent of the native phonology. Neither can the former provide support for the latter, nor can the latter explain the former.

Many scholars share the opinion with Harms that only surface phonetic constraints (SPC's) play a definite role in borrowing. But some of them go a step further to indicate that this fact establishes the psychological reality of only SPC's, with the implication that more abstract theoretical constructs are not justified, at least in the case of loanwords. This is the second type of opinion, represented by Shibatani (1973) who has developed a model of SPC's in detail.

The third type of opinion is in total opposition to the second one, and in sharp contrast with the first one, too. This is best exemplified in Hyman (1970) where MSC's and P rules rather than SPC's are held to play a key role in borrowing, and the process of borrowing is even proposed to be an evaluation metric of competing

analyses.

The latter two types of opinion will be examined in sections 4 and 3 respectively. Both of them are backed up by data from various languages, and shown to be convincing in their own way. How is one going to resolve this apparent paradox when contradictory opinions both find support from loanwords?

One possibility is that Harms is right after all. The process of assimilating foreign words is unpredictable; if it appears to follow any existing phonological theory, it is at best a coincidence. All these arguments presented by proponents of the latter two types are not worth a fig because they can always seek support from a small part of data that fit the theory concerned while ignoring the bulk of remaining data.

Another possibility is the reverse to the first type of opinion represented by Harms, and is argued for in this paper. Instead of being meaningless coincidence, the loanword data supporting the latter two opinions each may well reflect one facet of the complex phenomena of adaptation. That is to say, what is found out about the loanwords in section 3 does not invalidate the theories in section 4, nor conversely; rather, these discoveries respectively validate the theories in the two sections. The reasons why one can evoke loanwords to justify theories are sought in section 5.

### **3. Borrowing as justification for P rules & MSC's**

The Nupe data presented in Hyman and the Japanese loanwords from English in Ohso (1973) along with their arguments are dealt with in this section.



### 3.1. Nupe

As a Kwa language of Central Nigeria, Nupe has borrowed quite a few words from the neighboring Yoruba and Hausa. Hyman uses these loanwords to show the inadequacy of recognizing only "phonemes" as playing a role in the process of nativization. There are cases where he believes one has to go beyond the autonomous phonemes to deeper underlying representations (UR's) recognized by generative phonology in order to satisfactorily explain the adaptation.

Five P rules in Nupe that are relevant to our discussion are:

$$(1) \text{ SR } \begin{bmatrix} s \\ z \\ ts \\ dz \end{bmatrix} \rightarrow \begin{bmatrix} \check{s} \\ \check{z} \\ \check{c} \\ \check{j} \end{bmatrix} / \_ \left\{ \begin{array}{l} i \\ e \\ \epsilon \end{array} \right\}$$

This strident rule (SR) derives palatal stridents from dental ones before front vowels.

$$(2) \text{ GS } h \rightarrow \begin{bmatrix} \alpha \text{ round} \\ \alpha \text{ back} \end{bmatrix} / \_ \begin{bmatrix} \alpha \text{ round} \\ \alpha \text{ back} \\ \text{v} \end{bmatrix}$$

This glide spelling (GS) rule converts the glide "h" to "w" or "y" in front of back or front vowels. It remains "h" before underlying "a".

(3) RED

$$\phi \rightarrow \text{Cx} \begin{bmatrix} +\text{high} \\ \alpha \text{ round} \\ \alpha \text{ back} \end{bmatrix} / \_ \text{Cx} \begin{bmatrix} \alpha \text{ round} \\ \text{v} \end{bmatrix}$$

Examples of reduplication (RED):<sup>1</sup>

Loanwords and Phonology

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/ge/ "to be good" --> [gʸigʸe] "being good"  
 /go/ "to receive" --> [gʸugʸo] "receiving"

(4) LR/PR  

$$C \rightarrow \begin{bmatrix} +high \\ \alpha \text{ round} \\ \alpha \text{ back} \end{bmatrix} / \_ \_ \begin{bmatrix} \alpha \text{ round} \\ \alpha \text{ back} \\ V \end{bmatrix}$$

**Examples of labialization/palatalization (LR/PR):**

/ge/ --> [gʸe] "to be good"  
 /go/ --> [gʸo] "to receive"  
 /ga/ --> [ga] "to separate"

(5) AN  $\left\{ \begin{matrix} \text{ɔ} \\ \text{ɛ} \end{matrix} \right\} \rightarrow a$

Absolute neutralization (AN) is the rule that prevents the underlying "ɔ" and "ɛ" from occurring in surface forms.

Let us look at the derivation of some of the native Nupe words using these P rules.

"beginning" /tsɛ/ --> čɛ --> čičɛ --> cʸicʸɛ --> [čʸičʸa]  
SR            RED            PR            AN

"choosing" /tsa/ --> -- --> tsitsa --> [tsʸitsa]

"wanting" /hɔ/ --> wɔ --> wuwɔ --> [wuwa]  
GS            RED            AN

"being hanging" /ha/ --> -- --> [hiha]

**3.1.1. Insufficiency of surface constraints**

Similar to the example [tsʸitsa] "choosing" above, there is [sʸisa] "cutting", reduplicated from /sa/, to stand side by side with [šʸišʸi] "buying" and [čʸičʸa] "beginning". It is because RED is

placed after SR that we see the contrast between "s" and "š" before "i" in surface forms.

Now compare that with the Yoruba loan "sixpence" (borrowed into Yoruba from English "six"):

Yoruba	Nupe
sisi	š <sup>y</sup> iš <sup>y</sup> i <sup>2</sup>

Since surface constraints do not constrain "s" from occurring before "i", they could not have precluded [s<sup>y</sup>is<sup>y</sup>i] from being adopted. The fact that it is not the form used by the Nupe needs some explanation.

Hyman argues that when a foreign word enters the borrowing language, its form is taken as the UR in the phonology of the target language if it conforms to the MSC's of the latter.

Therefore the above loanword's Yoruba form [sisi] is treated as the UR /sisi/ in Nupe. Then, it undergoes all the relevant P rules to arrive at the surface form [š<sup>y</sup>iš<sup>y</sup>i].

### 3.1.2. Rule productivity

Hyman even asserts, "Every morpheme structure condition and phonological rule that I have found necessary to postulate in my work on Nupe...can readily be shown to be productive through borrowed forms." (1970:23)

We will first look at the productivity of MSC in vowel epenthesis.

Three relevant MSC's are:

- (6) A Nupe morpheme is typically (V)CV(CV).<sup>3</sup>

(7)  $\left[ \begin{array}{c} +\text{high} \\ \text{v} \end{array} \right] (\text{h}) [+ \text{labial}]$

↓  
 $\left[ \begin{array}{c} +\text{round} \\ +\text{back} \end{array} \right]$

(8) V h a

↓  
a

Here are the data:

Hausa	Nupe	
fuska	fušika <sup>4</sup>	"face"
mulki	muliki	"authority"
alwa:si	aluwaši	"boasting"
albasa	alubasa	"onion"
alhaji	alahaji	"Mecca Pilgrim"

When these Hausa forms enter as UR's into Nupe, they have to be modified so as to conform to MSC (6). To break up the consonant clusters, /i/ is inserted. But if the following C is labial, /u/ is inserted instead; and if "h", /a/ is inserted.

Why are /u/ and /a/ chosen to substitute /i/ in these environments? It is hard for surface constraints to explain them because we do see forms (after reduplication) like:

[biba] "being sour"                      [hiha] "being hanging"

But when we look at MSC's (7) and (8), it becomes clear that nothing but /a/ can precede a sequence "ha" in UR, and a high V that precedes a labial must be /u/.

Next, let us see how the controversial AN (cf. Harms) is shown to be productive in the following loanwords.

Yoruba	Nupe	
k <sub>E</sub> k <sub>E</sub>	k <sup>y</sup> ak <sup>y</sup> a	"bicycle"
ε gb <sub>E</sub>	egb <sup>y</sup> a <sup>5</sup>	"name of town"
t>r <sub>E</sub>	t <sup>w</sup> ar <sup>y</sup> a	"to give a gift"
k>b>	k <sup>w</sup> ab <sup>w</sup> a	"penny"

It is remarkable that those E's and >'s in the source language correspond to <sup>y</sup>a's and <sup>w</sup>a's in the target language so beautifully.

### 3.1.3. Rule interference

What happens if the foreign word contains a sound that is not a morphophoneme, but a derived form, in the borrowing language? Two situations may arise. If it occurs in the derived environment of the borrowing language, it is realized identically.

Hausa	Nupe	
fu:ṣ̌i	fuṣ̌i	"anger"

If it is not in the derived environment, the original environment is changed to imitate the derived one.

Hausa	Nupe	
ṣ̌u:gaba	ṣ̌igaba	"leader"
ṣ̌umma <sup>?</sup> a	ṣ̌ima	"Friday"

In other words, u(:) in the loaning language is changed into i through what is termed by Hyman, the "interference", of SR.

### 3.1.4. Ordering of rules

A very intricate phenomenon in the borrowing data is explained by Hyman using rule ordering, which is incidentally a support for the ordered P rules.

Hausa	Nupe	
A) dəgə	d ă g ă	"from"
zərəfi:	z ă r ă fi	"wealth"
k b ri:	k ă b ă ri	"grave"
B) wərki:	woriki	"loin-cloth"
wəsəli:	wosăli	"vowels in Arabic script"

The phonetic [ ă ] in Nupe is derived from /a /. The rule can be written as:

$$(9) \quad a \rightarrow \text{ă} \quad / \left[ \begin{array}{l} +\text{nasal} \\ \text{-----} \end{array} \right]$$

Loanwords in group (A) can be viewed as the result of interference of (9). In order to get the derived [ă], the environment (the segment itself) is changed to [+nasal].

How do we account for those in group (B), especially when there are native forms like [ewă] "pregnancy"? Obviously this is another instance not to be solved by surface constraint.

The reason perceived by Hyman is that Rule (9) is placed after GS. Words in (A) have no structural descriptions (SD's) necessary for the interference of GS, therefore only the effect of (9) is felt; foreign [ă] enters native lexicon as /ă / which is later changed into [ ă ], when going through P rules.

Words in (B) meet the SD requirement of the earlier-ordered GS, the relevant part of which is rewritten as (10).

$$(10) \quad h \rightarrow w / \_ \_ \left[ \begin{array}{l} +\text{round} \\ +\text{back} \\ \text{V} \end{array} \right]$$

To get the derived "w" means to change the following V " " into [+back, +round], i.e. "o". The foreign sequence [w ] is accordingly transferred into the native UR sequence /ho/. After this interference, (9) is no longer capable to interfere.

As suggested by all the data above, it does seem that borrowing can justify the existence of P rules and MSC.

### 3.2. Japanese

Ohso bases her work of Japanese loanwords on the Natural Phonology developed by David Stampe (1969, 1973).

What she tries to prove is that the processes used in nativizing foreign words are accountable in terms of the processes in the phonology of the borrowing language. Her assumption is apparently that borrowing can justify a model of phonology.

The concept of Natural Phonology may be crudely described as follows. People are born with a complete set of P processes which can be traced directly to the physical phonetic reasons, such as for the ease of articulation. But once they are put to use by children in learning to speak, they become fully mental processes, without any connection to the physiology of articulation. During language acquisition, some processes are suppressed, and some are reordered, depending on the structure of the particular language being learned. What remains in the end are those processes necessary to the phonology of that particular language.

The conditions and constraints in phonological theory in general are treated as processes in Natural Phonology. Natural Pho-

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nology also contains a lot of superficially invisible processes not suspected to exist in other theoretical models.

### 3.2.1. Dominant and dominated rules

We will first look at two terms: dominant rules and dominated rules.

(11) Dominant rules constrain UR.

(12) Dominated rules create the segments that are excluded by the dominant rules.

Examples from Japanese are:

(13)  $C \rightarrow [-\text{pal}]$

(14)  $C \rightarrow [+pal]/\_\_ \begin{matrix} [-\text{con}] \\ [+high] \\ [-back] \end{matrix}$

(13) is a "dominant" rule stating that every C in UR is not palatal, and (14) is dominated by (13) because it derives palatals again when any C is before "i" or "y".

Despite differences in terminology from that of Hyman, Ohso offers a rather similar account of how foreign words are assimilated.

If a foreign form is admissible as an instance of the UR of the borrowing language, it is put into the lexicon as it is. Its surface form is obtained after all processes of the native phonological component have been applied. If it is not admissible, it is first analyzed by some dominated rules (cf. the rule interference in Hyman), the appropriate form resulted will then be entered in the underlying lexicon. If no admissible form is found after all possible analyses have been done, it is processed by the dominant rule which



it violates (cf. the productivity of MSC) and the result is the UR needed.

### 3.2.2. Undo a rule

The analysis Ohso proposes differs from that of Hyman in offering an explicit choice when more than two choices are possible.

For example, MSC (6) in Nupe does not prescribe how to eliminate consonant clusters; either dropping some of them or inserting new vowels will do. And if V epenthesis is chosen, we still do not know which one of several acceptable V's to epenthesize.

Japanese also inserts vowels to break up consonant clusters of loanwords. Ohso suggests that a rule which deletes high vowels in fast speech should be responsible for V insertion in foreign words.

$$(15)^6 \left[ \begin{array}{c} \text{V} \\ +\text{high} \\ +\text{back} \end{array} \right] \rightarrow \phi / [-\text{voice}] \_ \left\{ \begin{array}{c} [-\text{voice}] \\ \# \end{array} \right\}$$

(15) is a dominated rule that is able to create a consonant cluster which is not allowed by a set of dominated rules constraining UR's in Japanese. Now the inadmissible consonant clusters in loanwords that do not conform to the native UR's are analyzed by (15). That is to say (15) is "undone"; an "u" is inserted between CC cluster. The resulted form is then admitted into the underlying lexicon.

Unfortunately this rule does not solve every thing. Compare the following loanwords:

## Loanwords and Phonology

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English	Japanese	
klʌb	kurabu	"club"
krim	kuriimu	"cream"
hit	hitto <sup>7</sup>	"hit"
bɛd	beddo	"bed"

We can see that "u" is inserted even before voiced consonants "r" and "l" -- against the environment specified in (15). Ohso says simply, "here I will suppose that rule [15] is expanded to the environment of voiced consonants in borrowing."

As for "o" insertion, it seems to occur regularly after "t" and "d", as pointed out by Otake (1983). Ohso explains that "o" is the third shortest V in Japanese, just next to "u" and "i", so it is also the third easiest to delete or to insert. The relation between "t, d" and "o" is left unexplained.

### 3.3. Temporary conclusion

Evidence is given by Hyman to convince us that the adaptation of loanwords does apply P rules and MSC's developed by the generative phonology. But not every step of the adaptation is explainable in these theoretical models, even the processes proposed by Ohso in the framework of Natural Phonology can only offer a partial answer to the caprice of nativization.

#### 4. Borrowing as justification for surface constraints only

To establish the status of the concrete surface phonetic constraints in the theory of phonology, Shibatani seeks support from various kinds of empirical evidence. One of them is borrowing. He is aware of Hyman's argument which he declares "is diametrically opposed to what I claim below." He does not directly attack the data or analyses presented by Hyman, however, but rather cites data from other languages to prove his view.

His and some others' similar ideas are discussed in this section.

##### 4.1. Japanese and Haya

(16) + ((C) (G) V<sup>2</sup> (C))<sub>1</sub> +

(17) # ((C) (G) V<sup>2</sup> (C))<sub>1</sub> #  
 ↓  
 n/ \_\_ #

(16) is the MSC of Japanese syllable structure, (17) is its SPC. The difference between them is that when there is a final consonant in a morpheme, it may be any C in UR, but only a syllabic nasal in surface form. It is because the stems ending in C take suffixes ending in V, rather than because any P rule inserts V.

English loanwords, such as [kurabu] and [hitto] listed in 3.1.4., will have no reason to insert a final V if MSC's and P rules are what to be applied in adaptation. Only an obligation to conform to SPC in nativization can explain the V epenthesis.

The same situation is found in Haya, a Bantu language spoken in north-western Tanzania (Byarushengo 1976), where MSC and SPC

of syllable structure differs in the former's permission of final C, and the latter's disallowing it.

English	Haya <sup>8</sup>
"soup"	esupu
"shirt"	esaati
"pilot"	omupailoti

Nothing else will encourage final V insertion there except for SPC.

#### 4.2. Korean

(18) ~## l

Historically Korean had the same MSC (with morpheme boundary instead of word boundary before "l") like the SPC (18) which is still active now. They dictated that no morphemes nor words should begin with "l". But Chinese loanwords conformed only to SPC, not to MSC.

Chinese <sup>9</sup>	Korean	
lok	nok	"green"
lam	nam	"blue"
lo +in <sup>10</sup>	no +in	"old man"
čo +lo	čo +lo	"premature decay"

Shibatani states that the alternation between [lo] and [no] for the same morpheme meaning "old", and other similar cases resulted from large-scale borrowing have encouraged the addition of a new rule accounting for l/n distribution, as well as the obsolescence of the MSC that once precluded the morpheme-initial "l".

SPC here again shows its superiority over MSC and P rules-- it even creates one--in loanword adaptation.

### 4.3. Russian against Nupe

Johns (1969) cites a loanword in Russian to show the value of autonomous phonemics, i.e. the necessity of surface restrictions.

English	Russian
"kangaroo"	kengurú

Russian morphemes in general, esp. noun stems, do not end in a stressed u. But words with inflectional ending do end in u; such as idú "I go", stolú "to the table". Therefore, kenguru violates MSC, but conforms to SPC.

Such an example is an exact opposite to the Nupe loanword [sisi] (with palatalization omitted) from Yoruba, repeated here.

Yoruba	Nupe	
sisi	šiši	"sixpence"

Nupe's SPC does not rule out [si] sequence, as shown in the word "cutting" [sisa]. That the loanword does not take "sisi" directly as the borrowing form has been demonstrated by Hyman to prove the productivity of MSC, and of the rule SR.

Harms has pointed out in a footnote that "sixpence" is lexicalized in Nupe as [sisi]. Hyman (1973) answers that "some Nupes say [sisi], some [šiši]."

Such a fact can be argued in two ways. Those who are for SPC can say that no prediction about nativization is possible except for the requirement of conforming to SPC. [si] and [šiši] are both

possible, therefore both [sisi] and [šiši] are possible loanwords. Those who are on the side of Hyman can say that people who speak [sisi] do not nativize the foreign word, but just reproduce the accurate pronunciation of the source language. Therefore only [šiši] is able to tell us anything about the process of adapting a loanword.

#### 4.4. Who wins the debate?

From the data in this section, it seems conclusive that SPC rather than any other element in the phonological theory plays a role in modifying borrowing words.

This is contradictory to what we arrive at in the last section, where MSC and P rules rather than SPC demonstrate their influence on those loanword data significantly.

Each party stands firmly on the ground of their own data. But no one has attempted to knock down the opponent using the opponent's data, and it is probably not that they don't want to, but that they wouldn't win in that way.

What on earth causes this situation in which no one loses nor anyone wins completely? The reason is sought in the next section.

## 5. Denouement

Two things should be clearly distinguished.

One is the study of language borrowing, which includes the description, and explanation when possible, of all facets of the borrowing phenomenon.

The other is the APPLICATION of the study of language borrowing, such as using some findings in this study as empirical evidence of the psychological reality of some other linguistic theory.

### 5.1. The study of "borrowing linguistics"

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If one is going to study one branch of the "borrowing linguistics-

tics", the nativization of loanwords, the first thing he must face is a whole range of loans that reveal assimilation in different degrees. At one end of the assimilation scale, there are words that sound totally foreign; at the other end, no difference from native words can be sensed at all.

From the phonological point of view, nothing can distinguish these completely assimilated loans from native words, and nothing is going to be said about them. But from the viewpoint of the study of nativization, the process these words undergo during assimilation is all important. Sometimes the trouble is to find out which is loaned and which is native (of course with recourse to other evidence than phonology).

All the other words in between the two extremes are also subjects of the study. One will suspect that they can be grouped linearly into different sets; words of the same set manifest the same degree of assimilation. That is to say they will behave in the same way as to applying or not applying a rule whose SD they fit. This has prompted Kiparsky to suggest that a hierarchy of rule features should be a better treatment than a simple diacritic feature [+foreign].

The scene is complicated by Holden's (1976) finding that loanwords not only differ among one another in assimilation rate, the segments WITHIN a word also display varying rates of assimilation.

Bearing all these differing degrees of nativization in mind, now let us look at the process of nativization.

The present phonological theories in general do not aim to describe the nativization of loanwords. It is no wonder that many processes of nativization are not found in the devices provided by

these theories.

We have seen the not very successful treatment of V epenthesis for Japanese loans attempted in the framework of Natural Phonology. One is entitled to say that few languages offer ready-made epenthesis or deletion rules in their native phonology that can match the adaptation processes point by point.

It is very likely that many processes to assimilate loans are unheard of in the language's regular P processes. One example will suffice.

Otake in accounting for the pitch accent system of English loanwords in Japanese has found a rule that shifts the accent of CVCVCV structure to the first syllable. This will neatly explain the otherwise incongruity in the pattern.

English	Japanese
"spý"	<u>supai</u>
"pláy"	<u>purée</u>
"freezing"	<u>furii</u> jingu
"emérgency"	ema <u>a</u> jensii
"dráma"	<u>dorama</u>
"banána"	<u>banana</u>

The last two examples do not conform to the general constraint that the accent be placed on the syllable containing the main V which corresponds to the accented V in the source language (other details omitted here).

With that extra accent shift rule, these two "exceptions" are explained. But evidently no such accent shifting exists in the native



words. For example:

kokoro                      "heart"

Let us turn back to the opinion held by Harms toward loanwords, introduced in section 2 as the first type. We can see that his idea is in agreement with ours to the point that current phonological theories cannot explain loanword adaptation. But he thinks it follows that loanwords are irrelevant to the justification of phonological theories. Here we disagree. The latter is no logical consequence of the former at all. We will see what kind of relationship loanwords bear to the theories. And only by emphasizing the distinction between the study and the "use" of linguistic borrowing can make this point clear.

## 5.2. The application of "borrowing linguistics"

If the study of borrowing turns out a whole set of assimilation processes, their applicability on different loans or different segments of loans determined by the degree of nativization of each word or segment itself, then what does this set of processes have to do with the synchronic phonology of the borrowing language?

Or more specific, what can we say if some of this set are similar to the P rules? Harms thinks that even when a nativization rule is identical with an abstract P rule, it does not mean that the former can justify the latter.

But I do not believe that the identification between a nativizational rule and a P rule can be dismissed as a pure coincidence. Loanwords may be described as the battlefield of the structures of two languages. Nativization is the gaining ground of the native structure. It is unlikely that in this dynamic display of language structure, nothing pertinent to the knowledge of that struc-

ture will reveal itself.

Loanwords in Section 3 are simply a justification of MSC and P rules; while data in Section 4 justify SPC. It is not inconceivable that different strategies to adapt foreign words are used in different languages. And it is even more likely that different strategies are used in one language. The examples cited by these authors are each a partial, and possibly prejudiced, picture of the loanword phenomenon. The best way to prove this, of course, would be to study any of the languages mentioned above, and find the loanwords which conform to the devices that are not observed by these authors. Or just study the loanword adaptation of any language, and see if all three constructs, MSC, P rules, and SPC, are showing their influence there.

Although I am not able to do any research of the kind, perhaps two loanwords in the Nupe data cited above may give us a hint. One is:

Hausa	Nupe	
alwa:si	aluwaṣ̌i	"boasting"

If we apply Hyman's method to modify the Hausa form according to the MSC's and the interference of P rules of Nupe, the source-underlying representation should be /alah si/. The inserted V is /a/ because it precedes the glide /h/ (cf. MSC (8)). The glide is /h/ because Nupe has only one underlying glide /h/, and the following /ɔ/ is obtained through the interference of (2), the glide spelling rule. This UR after all regular P processes derives the surface form [alawaṣ̌i] rather than the existent [aluwasi].

Another is:

Yoruba

Nupe

ε gb ε

egb<sup>y</sup>a

"name of town"

There is a MSC in Nupe that allows only /e/ and /a/ to be the initial V preceding a CV sequence. This may have precluded the Yoruba initial "ε" from becoming the underlying initial /ε/, and from deriving [a] through the rule of absolute neutralization (5). But why does Nupe choose /e/ instead of /a/ when both are equally acceptable UR forms?

No one can overlook the fact that [aluwa] approximates [alwa] better than [alawa] phonetically. It is very likely that [eg] in Nupe is also more similar to [εg] in Yoruba than [ag] is. If such superficial reason such as acoustic similarity can account for some processes of assimilating foreign words, one can hardly deny the possibility that SPC's may manifest their power too, in nativization of loanwords in Nupe.

I would conclude that loanwords do provide empirical evidence regarding the psychological reality of grammar in general, phonology included. Let us look at a final example.

In Haya the vowels of English loanwords usually have regular correspondence with English: "a" corresponds to English "ʌ, ə, æ, a".

English	Haya
"pass"	epasi
"singer"	singa
"map"	emapu
"manner"	mena

The realization of the last word deviates from the normal course.

The reason is that "mana" is a taboo word in Haya. The expected "a" is accordingly forced to change into "e".

This modification in nativization can well prove the psychological reality of the sociolinguistic idea of "taboo". One should be surprised if other modifications made in nativization cannot justify other ideas in linguistics, too.

## NOTES

1. Tones are omitted in all examples. The palatalization and labialization of "g" in the following reduplication forms are explained in rule (4).
2. It differs from "buying" in tone.
3. Syllabic nasal is ignored, which possibly has a NV source.— According to Hyman's own footnote.
4. The "y" and "w" derived by LR/PR are omitted in these examples, and will be when they are not significant.
5. That the cluster "gb" is not broken up is possibly due to partial assimilation (see 5.1. below).
6. This is only half of the high V deletion rule proposed by Ohso. The other half deals with "i" deletion. The discussion concerning "i" insertion in loanwords is also omitted here.
7. The complicated phenomena of C gemination is omitted here.
8. Stresses are omitted in these examples. "e" and "omu" are prefixes indicating word classes in Haya.
9. Ancient Chinese.
10. "+" indicates morpheme boundary. "lo+in" and "čo+lo" are the underlying Korean forms in Shibatani; they are placed beside other Chinese words here for expository reason.

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# **The One-Step Principle as a Derivational Constraint in Some Chinese Dialects**

Hui-chuan Hsu

The main theme of this paper is to discuss a derivational constraint on tone sandhi (TS) in Chinese dialects, namely the One-Step Principle (OSP), which says that a tone-bearing unit cannot undergo tone sandhi more than once. In this paper, I will demonstrate how the puzzling trisyllabic TS in Changting can only be accounted for, and portray clearly what the picture of the OSP is in section 1. I will provide more supporting evidence for the OSP from Huojia (a Northern Mandarin dialect), Tianjin (also a Northern Mandarin dialect), and Pingyao (a Jin dialect) in section 2. Theoretical implications are related the following questions: (1) Is OSP applicable in the African tone languages? (2) Does OSP hold in the segmental derivation? (3) What might the cognitive motivation of OSP be? I will answer these questions at the end of this paper.

## **1. Changting**

### **1.1 Background**

Changting is a Hakka dialect spoken in Changting County, Fujian Province, China. It has a five-tone system [33, 24, 42, 54, 21], where numbers denote pitch height on a five point scale. The focus of this section is concerned with trisyllabic strings in



Changting, which can be derived directly on the basis of disyllabic tone sandhi below.

(1) (a) Merger

33 --> 21 / \_\_\_ 21, 24  
 21 --> 33 / \_\_\_ 54, 33, 42

(b) Leftward TS

24 --> 44 / \_\_\_ 33  
  
 42 --> 213/ \_\_\_ 33  
  
                   21 / \_\_\_ 24  
                   33 / \_\_\_ 42

(c) Rightward TS

21 --> 42 / 24 \_\_\_

(d) Bidirectional TS

42 21 --> 213 42

According to Hsu (1991), the mode of TS rule application in Changting is indifferent to branching structure; that is to say, given an underlying representation, the output will be one and the same no matter what kind of structure it is, left-branching or right-branching. In this vein, the mode of rule application in Changting is not cyclic. Instead, it is iterative, either left to right or right to left. To put it further, at the very beginning of tonal derivation any trisyllabic string is faced with a fork, as schematized below:

(2) a. x    x    x                    b. x    x    x  
           |\_\_\_\_\_|                            |\_\_\_\_\_|  
                   |\_\_\_\_\_|                            |\_\_\_\_\_|

## The One-Step Principle

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In this section, I want to focus my attention on two principles, namely the one-step principle and tonotactics, which behave like filters to rule out illegal derivations. Shortly, we will find in section 1.4 that they interact with each other to some degree to account for trisyllabic tone sandhi of the dialect in a most convincing way.

### 1.2 The One-Step Principle

If a certain tone sequence meets the structural descriptions of two rules at the underlying level, there are two possible derivations. It could be that both are available if the resultant output is the same, or that only one of them is correct. For the latter case, we find a principle, namely that a syllable, the tone-bearing unit in Chinese dialects, cannot undergo tone sandhi more than once during the derivation, as illustrated by the following examples:

(3) moo [ha lo] 'no whereabouts'

no whereabouts

24 33 21

21

42

\* 24 42 21

=====

24 33 21

44

21

44 21 21

(4) moo [va ti] 'didn't inform'

no inform

24 21 33

42

213

\* 24 213 33

=====

24 21 33

33

44

44 33 33

In the above cases, we find a similarity among the ill-formed derivations, namely that the second syllable applies TSR twice. The one-step principle seems to provide an account for the undesirable output.

### 1.3 Tonotactics

Among some trisyllabic data I reach a common point, specifically, a derivation will be ruled out if a disyllabic sequence of possible tone sandhi exists at the level of the surface representation. In other words, tonotactics is a well-formedness condition for the output. Consider the following examples. Note that possible sequences of tone sandhi will be parenthesized.

(5) seng [no mi] 'new glutinous rice'

new glutinous rice

33 21 42

21

33

\* (21 33) 42

=====

The One-Step Principle

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33 21 42

33

NA

33 33 42

(6) [mai ti] fa 'white jasmine'

jasmine flower

21 21 33

NA

33

\* (21 33) 33

=====

21 21 33

33

33

33 33 33

From the above examples, we come to the conclusion that a derivation is to be rejected if the output violates tonotactics, that is to say, if there exists a possible sequence of tone sandhi at the level of the surface representation. The prudent reader might claim that reapplication of tone sandhi to the ill-formed output would generate the correct surface form. More precisely, in (5-6), the application of the rule 21 --> 33 / 33 to the illegal tone sequence would result in the desired output; however, the hypothesis is premature according to the following example:

(7)	[Su	ko]	t'ong	‘fruit	candy’
			fruit	candy	
	42	42	24		
	33				
		21			
	(33	21)	24		
	42	42	24		
		21			
	213	42			
	*	213	(42	24)	

If tone sandhi reapplies to the ill-formed sequence, the output would be 213 21 24, which is obviously not the correct output. Cases like (7) are actually related to the interaction between the one-step principle and tonotactics, and will be further pursued in section 1.4.

### 1.4 Tentative Solutions

In this section, I will point out one possible hypothesis which might tame the recalcitrant trisyllabic tone sandhi patterns of the dialect. The common denominator is that no single principle can be found to tackle the puzzle. Instead, I will argue that the one-step principle and tonotactics have to operate together to solve the problem. The gist of the hypothesis is summarized as follows:

- (8) (a) The one-step principle and tonotactics can predict the directionality of rule application. Within two options, say, from left to right, or from right to left, if either of them is violated, the directionality will change.
- (b) In cases where the one-step principle is violated in one way of the derivation, and tonotactics in the other, the one-step principle wins out to determine the directionality of rule

application.

- (c) The default directionality of rule application is from left to right.

This hypothesis provides an explanation for most trisyllabic data. (8)(a) finds pieces of supporting evidence from (3-4) in section 1.2, and (5-6) in section 1.3. As for (8)(b), let us consider the following cases:

- (9) vai [p'a ts'iang] 'still clean'

still clean

24 21 21

42

213 42

\* 24 213 42

=====

24 21 21

NA

42

24 (42 21)

- (10) kui [fa p'u] 'bad calligraphy'

ghost draw

42 21 24

213 42

21

\* 213 21 24

=====

42 21 24

NA

213 42

213 (42 24)

In (9) and (10), both the one-step principle and tonotactics are violated. As shown above, the former makes a much stronger prediction as to how to derive a surface output. Now let us turn to (8)(c), which says that the default directionality of rule application is from left to right, as illustrated below:

(11) [sang leng] tS'a 'tricycle'

three wheel car

33 24 33

44

na

\* 33 44 33

=====

33 24 33

21

44

21 44 33

(12) loo [ku tong] 'old curios'

old curios

42 42 42

33

213

\* 213 33 42

=====

42 42 42

33

33

33 33 42

In (11) and (12), neither the one-step principle nor tonotactics is violated, hence, the determiner of directionality of rule application

is the default case, namely from left to right.

## 2. Huojia

Huojia is a Northern Mandarin dialect spoken in Henan Province, China. Except for the neutral tone, Huojia has five citation tones, namely, 33, 31, 53, 13, and 3. Like the other Mandarin dialects, Huojia is strongly determined by prosodic structure in its TS behavior. More precisely, TS applies first to immediate constituents (IC). According to Zhang (1990), there exists an asymmetrical pattern in Huojia TS, namely, tone sandhi rules (TSR) must apply in the 2nd cycle of right-branching structures, but must be blocked in the 2nd cycle of left-branching structures. Below are supporting examples, where the relevant rules are listed in (13):

- (13) (a) 33 ---> 31 / \_\_\_ 13  
 (b) 53 53 ---> 31 13 / everywhere

- (14) jin [jie-zhi] 'gold ring'

gold	ring		
33	13	n	(n=neutral tone)
	NA		(NA=not applicable)
31			(by (13)(a))
31	13	n	
=====			
33	13	n	
	NA		
NA			((13)(a) blocked)
* 33	13	n	



(15) lao [mu-zhu] 'old sow'

old sow

53 53 33

NA

31 13 (by (13)(b))

31 13 33

-----  
53 53 33

NA

NA ((13)(b) blocked)

\* 53 53 33

(16) [chuan-yi] jing 'full-length mirror'

dress mirror

33 33 13

NA

31 (by (13)(a))

\* 33 31 13

-----  
33 33 13

NA

NA ((13)(a) blocked)

33 33 13

(17) [yi xin] bing 'skepticism'

suspect disease

31 33 13

NA

31 (by (13)(a))

\* 31 31 13

-----  
31 33 13

NA

NA ((13)(a) blocked)

31 33 13

The One-Step Principle

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However, the asymmetrical pattern is untenable in the right-branching structures of X 33 13, where TS must be blocked in the 2nd cycle. I will argue that it is actually the possible violation of OSP that inhibits the application of TS in the 2nd cycle, as demonstrated below, where the relevant rules are listed in (18):

- (18) (a) 33 ---> 31 / \_\_\_ 13  
 (b) 31 ---> 13 / {33, 31, 53, 3} \_\_\_

(18)(a) is obligatory, while (18)(b) is optional.

- (19) sin [zhu-juan] 'new pigsty'
- |       |    |        |                             |
|-------|----|--------|-----------------------------|
| new   |    | pigsty |                             |
| 33    | 33 | 13     |                             |
|       | 31 |        | (by (18)(a))                |
| 31    | 13 |        | (by (18)(b) & (18)(a))      |
| * 31  | 13 | 13     |                             |
| ===== |    |        |                             |
| 33    | 33 | 13     |                             |
|       | 31 |        | (by (18)(a))                |
| NA    |    |        | ((18)(b) & (18)(a) blocked) |
| 33    | 31 | 13     |                             |

- (20) xian [ji-dan] 'salty egg'
- |       |    |     |                   |
|-------|----|-----|-------------------|
| salty |    | egg |                   |
| 31    | 33 | 13  |                   |
|       | 31 |     | (by (18)(a))      |
|       | 13 |     | (by (18)(b))      |
| * 31  | 13 | 13  |                   |
| ===== |    |     |                   |
| 31    | 33 | 13  |                   |
|       | 31 |     | (by (18)(a))      |
| NA    |    |     | ((18)(b) blocked) |
| 31    | 31 | 13  |                   |

it is hard to tell which is the right way to go further. We may assume that under the hypothesis of Parallel Distributed Processing, the speaker processes the two possibilities simultaneously, and use the one-step principle as a monitoring device to choose the right track of derivation.

### 3.2 Hypothesis 2

In this section I will argue that the left-to-right iterative mode of rule application together with the tonotactics is another key to the trisyllabic tone sandhi of Tianjin. By the tonotactics, I mean a possible input of TS is not allowed at the surface representation. In other words, tonotactics is a well-formedness condition for the output. Consider the following examples, where a possible sequence of TS will be parenthesized.

(26) [bao wen] bei 'thermo flask'

hot water vase

213 21 21

NA

213 (by (23)(a))

\*(213 213) 21 (iterative, L to R)

=====

213 21 21

213 (by (23)(a))

45 (by (23)(b))

45 213 21

way to account for its apparent exceptional cases.

### 3. Tianjin

This section centers around trisyllabic tone sandhi of Tianjin, which is so complicated that strenuous efforts have been made to disclose its nature (Chen, 1986, Tan, 1987, Zhang, 1987, and Hung, 1987). The focus of this section is to propose two hypotheses. In hypothesis 1, I will demonstrate that free ordering together with the one-step principle can account for trisyllabic data of Tianjin. In hypothesis 2, I will suggest that the iterative mode of rule application, from left to right, together with the tonotactics is another key to the puzzle.

#### 3.1 Hypothesis 1

In this section I will show that free ordering together with the one-step principle can illuminate the complex trisyllabic tone sandhi of Tianjin. As well-known, any trisyllabic string in the dialect can be derived on the basis of disyllabic TS rules. Yet the question is how the disyllabic rules interact to achieve the right output. Before I go into that, disyllabic TS rules are listed as follows:

- (23) a. 21 --> 213 / \_\_\_ 21  
b. 213 --> 45 / \_\_\_ 213  
c. 53 --> 21 / \_\_\_ 53  
d. 53 --> 45 / \_\_\_ 21

Now it is the right time to reveal how free ordering together with the one-step principle can offer an explanation for Tianjin. The gist of free ordering says that an obligatory rule must apply whenever its structural description is met, unless its application is precluded by some universal principle (Koutsoudas, Sanders, and

Noll, 1974). I will demonstrate that the one-step principles is exactly a universal principle filtering out undesirable derivation. Below are some supporting examples.

(24) kai [fei ji] 'fly airplane'

fly airplane

21 21 21

213 (by (23)(a))

213

45 (by (23)(b))

\*45 213 21

=====

21 21 21

213 (by (23)(a))

NA

21 213 21

(25) [su liao] bu 'plastic cloth'

plastic cloth

53 53 53

21 (by (23)(c))

21

213 (by (23)(a))

\*213 21 53

=====

53 53 53

21 (by (23)(c))

45 (by (23)(d))

45 21 53

In (24-25) the speaker is faced with a fork since the underlying tonal combinations of  $X_1 X_2$  (X stands for a syllable.) as well as  $X_2 X_3$  fit the environment of the same TS rule. According to free ordering,

it is hard to tell which is the right way to go further. We may assume that under the hypothesis of Parallel Distributed Processing, the speaker processes the two possibilities simultaneously, and use the one-step principle as a monitoring device to choose the right track of derivation.

### 3.2 Hypothesis 2

In this section I will argue that the left-to-right iterative mode of rule application together with the tonotactics is another key to the trisyllabic tone sandhi of Tianjin. By the tonotactics, I mean a possible input of TS is not allowed at the surface representation. In other words, tonotactics is a well-formedness condition for the output. Consider the following examples, where a possible sequence of TS will be parenthesized.

- (26) [bao wen] bei 'thermo flask'  
hot water vase  
213 21 21  
NA  
213 (by (23)(a))  
\*(213 213) 21 (iterative, L to R)  
=====
- 213 21 21  
213 (by (23)(a))  
45 (by (23)(b))  
45 213 21

- (27) xin [dian shi] 'new TV'  
 new television  
 21 53 53  
 NA  
           21 (by (23)(c))  
 \*(21 21) 53 (iterative, L to R)
- =====
- 21 53 53  
           21 (by (23)(c))  
 213  
 213 21 53

Pursuant to this hypothesis, the mode of rule application is iterative from left to right. If the surface representation provides an input to TS, it will be ruled out. Therefore, the directionality will be changed into right-to-left. As a matter of fact, Changting is another piece of supporting evidence for the hypothesis.

#### 4. Pingyao

Pingyao, a Jin dialect spoken in Shanxi Province, China, has six base tones (BT), as follows:

- (28) 1. !LM 2. LM 3. HM 4. MH 5. LM? 6. HM?

In connected speech, what tonal sequences actually emerge depends both on the combination of the base tones as well as the syntactic relations holding between the tone-bearing units. There are two types of syntactic relations, namely type A and type B. Subject-predicate and verb-object structures belong to type A, while all of the others fall under type B. In Pingyao given the same underlying represen-

tation, different syntactic relations will result in different surface output, as illustrated below:

- |      |                                 |  |
|------|---------------------------------|--|
| (29) | a. tsa xung 'make up'           | b. S <sup>6</sup> l <sup>7</sup> tC'i 'raise up' |
|      | rub powder                      | raise up   |
|      | syntactic type: A (verb-object) | B (verb-resultative)                             |
|      | base tone: LM - HM              | LM - HM  |
|      | surface tone: MH - HM           | ML - HM  |

In this section, I will demonstrate how OSP operates in Pingyao. In a null hypothesis the unmarked mode of rule application is cyclic. Yet, the possible violation of OSP triggers the swift of mode of rule application to be iterative L to R, which is compatible with the claim that speakers process neurologically left-to-right (Lakoff, 1990). Below are some pieces of supporting evidence, where relevant rules are listed to the right of the examples.

- (30) [ping-pang] Soo 'Speckles are few.'

speckle	few	
MH LM		HM
HM		(TSB, LM --> HM / MH ___)
MH		(TSA, HM --> MH / ___ HM)
*MH MH		HM(cyclic)
=====		
MH LM		HM
LM		(TSA, MH --> LM / ___ LM)
MH		(TSA, LM --> MH / ___ HM)
LM MH		HM(iterative L to R)



(31) [ioo-Seng] kuang 'The waistline is wide.'

waistline		wide	
LM	LM	LM	
ML	MH		(TSB, LM LM --> ML MH)
	LM		(TSA, MH --> LM / ___ LM)
*ML	LM	LM	(cyclic)
=====			
LM	LM	LM	
NA			(TSA, not applicable)
	NA		(TSA, not applicable)
LM	LM	LM	(iterative L to R)

(32) [pa?-tsl] xu 'moustache'

eight		beard	
LM?	MH	LM	
	LM		(TSB, MH --> LM / LM? ___)
	ML	MH	(TSB, LM LM --> ML MH)
*LM?	ML	MH	(cyclic)
=====			
LM?	MH	LM	
	LM		(TSB, MH --> LM / LM? ___)
	NA		(TS rules must be blocked)
LM?	LM	LM	(iterative L to R)

(33) Xing [lei-po?] 'new turnip'

new		turnip	
LM	LM	HM?	
	MH		(TSB, LM --> MH / ___ HM?)
	LM		(TSB, MH --> LM / LM ___)
*LM	LM	HM?	(cyclic)
=====			
LM	LM	HM?	
ML	MH		(TSB, LM LM --> ML MH)
	NA		(TSB, not applicable)
ML	MH	HM?	(iterative L to R)

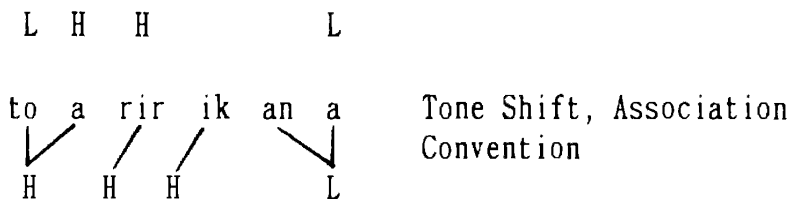
In (30) and (31), OSP will be violated if TSB applies before TSA cyclically; therefore the mode of rule application becomes iterative, and the inner morphosyntactic structure is erased. (32) is intriguing in that the possible violation of OSP is avoided by blocking the application of TS rule in the second cycle, otherwise the output of iterative application L to R will be identical with that of cyclic application. The example is reminiscent of what is discussed in terms of Huojia, where the possible violation of OSP is also avoided in this way. As for (33), it is obvious that OSP triggers the change of mode of rule application.

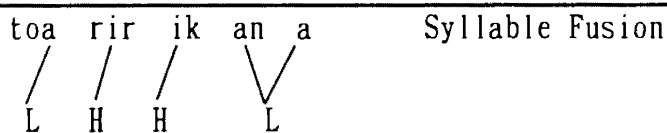
### 5. Theoretical Implications

In this section, I will point out some theoretical implications related to OSP, such as the applicability of OSP in the African tone languages, the discrepancy between tonal derivation and segmental derivation, and the possible cognitive motivation of the derivational constraint.

It is well-known that African tone languages paint rather different pictures than Chinese dialects with respect to TS, we wonder whether OSP is effective in the African tone languages as well, or OSP is unique to Chinese dialects. The following derivation of toaririkana from Kikuyu (Clementes, 1984) can answer the question.

(34) to a rir ik an a Underlying

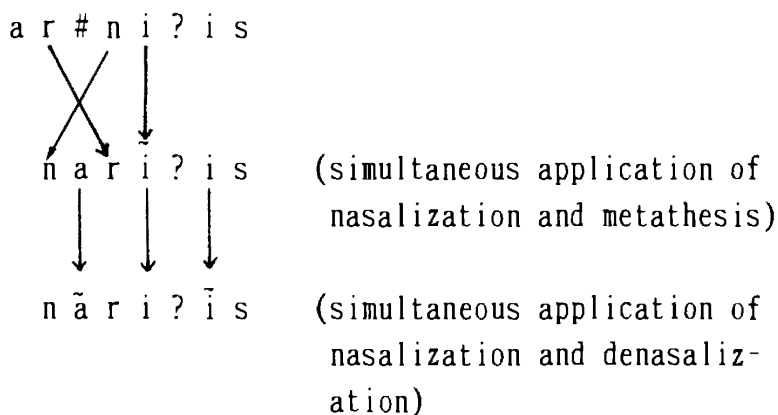




As shown above, OSP does not seem to hold in African tone languages. A tone-bearing unit can undergo different tone assignments as required. Therefore, OSP appears to be unique to Chinese dialects. A natural question arises here: Why does OSP fail in the African tone languages? Wang (1991, personal communication) suggests that perhaps the peculiarity of syllable structure is a possible answer. Beyond that, I would like to leave the question open for now.

Now let us turn to the discrepancy between tonal derivation and segmental derivation. Specifically, OSP is a unique phenomenon in tonal derivation of some Chinese dialects, whereas a segment can undergo phonological rules again and again as long as the structural description is satisfied, as demonstrated below.

(35) Sudanese (Anderson, 1972; reanalyzed by Ringen, 1976)



It is obvious that segmental derivation does not obey OSP, whereas

tonal derivation of some Chinese dialects does.

Finally, I want to discuss the possible cognitive motivation of OSP. Chen (1990) claims the existence of competing strategies towards tonotactic targets in Chongming TS. The main gist is that derivational simplicity is the premise on which the speakers can find the right track of processing. The simpler a derivation is, the more possible it is to win out among some competitors, as demonstrated below (Chen, 1990: 23):

(36) 'cashier'

a. Zhang-gui	b. ??
3-6	3-6 Tone category
HM-LM	HM-LM Base form
--	HM-n Deletion-X
HM-MH	-- Register
--	MH-n Melody
--	-- Dissimilation

The notion of parallel distributed processing (PDP) seems to fit here. More precisely, the speakers may process some derivations simultaneously, monitor the intermediate stages of derivation, and choose the right track. The phenomenon of derivational simplicity in Chongming is quite similar to that of OSP which can be regarded as a monitoring device filtering out the illegitimate derivation.

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# 方言混合 - 建陽聲母的演變

許蕙麗

## 摘要

本文以語言接觸對建陽聲母的影響為中心，從歷史和地理因素探討語音演變。前人的研究多半偏重語言的內部演變，而我同時考慮了影響語言發展的外在因素。在概論裡，我強調了本文由地理的觀點來探討方言混合的形成與發展。並指出前人努力追尋的以單一條件來畫分方言歸屬，不適用於語音系統複雜的方言混合例子，只有以一組特徵條件才足以畫分方言的歸屬。第二節討論了閩語的特性，而這些特性也出現於其它南方方言，由這些共通性，指出了南方方言語音演變的一致方向，並且驗證了方言的歸屬不能用單一的條件來判斷。第三節討論建陽聲母較少出現於其它閩方言的特性。這些特性可能是因為建陽的地理位置靠近浙江和江西省，受到方言接觸的影響而發展出來的。建陽聲母複雜層次的體現，導因於語言的內部變遷和外部的語言接觸。結論裡，引用了Jakobson的概念，討論建陽音系經過許多音變後的結構重整現象，並且指出建陽聲母的複雜層次，是典型的方言混合代表例子。



# **Dialect Mixture-- A Case Study of the Initial System of the Jianyang Dialect**

Hsu Hui-Li

## **ABSTRACT**

This paper concentrates on aspects of areal linguistics as revealed in the initial system of the Jianyang dialect. Researches in the past based on its system-internal development led to several illuminating discussions about the evolution of the Min dialects. Our approach is based on the historical and geographical factors of sound change. In the introduction, we propose that a dialect can be adequately identified by a cluster of phonological features, but not a single criterion, contrary to the assumption of previous studies. We list and discuss in section two the characteristics of the initial system of the Min dialect which preserve archaisms. Some of them are so widespread in southern dialects that they point to the consistent direction of the sound change. From the composite nature of dialects, it indicates the difficulty in classifying dialect group with a single criterion. In section three, we illustrate the characteristics of Jianyang that rarely appear in other Min dialects. These characteristics may be influenced by characteristics of its neighboring Wu and Gan dialects. We find that the complicated strata result from the combined effect of the internal development

and external language contact. In the conclusion, a set of phonological changes are provided to characterize the restructuring of initial system in Jakobsonian terms.

## 1. Introduction

This paper concentrates on the geographical and historical factors in the formation of a mixed dialect. Dialectal peculiarities may arise from these closely tied factors which make us confront great difficulties in sorting out the motivation of the sound change. Our approach to the study of mixed dialect is based theoretically on the geographical factors rather than merely on the historical factors.<sup>1</sup>

Our attention is focused on the jianyang<sup>2</sup> (hereafter JY) dialect in the northwestern part of the Fujian province. Owing to centuries of slow infiltration of northern features into this region, the dialects in the area along the boundaries among the Wu and Kejia manifest many close similarities in the development of the phonological systems. Therefore, this is a typical case representing the dialect mixture which makes us unable to delimit the dialect groups with any great precision at the present time. (Norman 1988: 190) Zhu (1986) indicates that it is better to classify the dialects by a single criterion. However, from the composite nature of the Jianyang dialect, we find that a dialect can be adequately identified by a cluster of phonological features, but not a single criterion, contrary to the assumption of previous studies.

We will sort out typical Min characteristics in section 2. After a general picture of Min dialect has been sketched, we introduce the characteristics of Jianyang in section 3. In comparison with these characteristics, the place of JY among Min dialects may be set. In

the conclusion, a set of phonological changes are provided to characterize the restructuring of its initial system in Jakobsonian terms. We conclude that the composite nature of the JY initials is a typical representation of dialect mixture which results from intimate contact with neighboring dialects.

## 2. The characteristics of the initial system of the Min dialects

In this section we will discuss the typical characteristics of the initial system of the Min dialects. Min is characterized as having the following traits: first, the major reflexes of Middle Chinese<sup>3</sup> (MC) voiced obstruents are unaspirated rather than aspirated initials. Second, the retention of dental stops which split into shetou (dental) and sheshang (supradental) initials in MC is a well-known feature of the Min dialects. Thus, the reflexes of MC 知<sup>4</sup> initial are like those of the 端 initial.

Third, the reflexes of 章, 昌, and 船 are similar to those of 見, 溪, and 群 in a small group of words like 枝, 指, 痣, 桅. The initials of these words are pronounced as /k/ in Min dialects. (Mei 1982: 115) Fourth, initials 心, 邪, 書, 禪 and 生 have merged into /ts/ or /tsh/ in the colloquial stratum but into /s/ in the literary stratum. For instance, the initials of words 實, 上 and 市 have the colloquial /ts/ and literary /s/ pronunciations.

Fifth, 匣 is realized as /k/, / $\phi$  /<sup>5</sup>, and sometimes as /kh/ in the colloquial stratum. Moreover, 群 and 匣 were in complementary distribution in the Qieyun (QY) times. 群 is only followed by the Grade III finals, while 匣 is followed by other types of finals. Thus, the realization of 匣 as /k/ in the initials of words like 猴, 縣, 滑 represents the conservative forms in the Min dialects. (Li 1982: 18)

In addition, the realization of 匣 as /k/ in the words of 胡, 喉, 會 retains the close relation with the initial 以 in the earlier stage. Thus the initial 匣 which is intimately linked with 云, 以, and 群 is the typical representation of the chronological stratum. The assumption is cogent because a striking number of reflexes of initials 云 and 以, are realized as zero initials.

Sixth, the reflex of the initial 云 being /x/ in the word of 雨 and that of the initial 以 being /s/ in the word of 檐 represent the colloquial stratum. The realization of 云 as /x/ can be associated with the /x/ or /h/ reflexes of the initial 匣 because the initial 云 was subsumed under the initial 匣 in QY times. Therefore, the realization of /x/ in the initial 云 represents the earlier stage of the sound system. In addition, in the light of phonetic compounds (諧聲字) a host of words with initials 以 and 邪 share the phonetic components (Liu 1957). Although /ts/ has been replaced by /s/ in the initial 以, the reflex of /s/ implies the close relation of these initials in the earlier stage.

Seventh, Min dialects keep a bulk of examples of unshifted bilabial initials in words where other dialects consistently have labiodentals. Therefore, there are no labiodentals, but only bilabials in the colloquial reading. In contrast, bilabials are replaced by glottal fricatives in the literary reading. (Pan et al. 1963: 476-478; Huang 1984: 161-164; Chen & Li 1982: 28; 1984: 166; Lien 1989; Zhang 1985: 174-177)

In view of the characteristics sketched above, we find that some of the chief features also appear in other dialects of Chinese. Below we will briefly demonstrate the distribution of these features in other dialects according to (Chang 1990b), (Norman 1982), and (Li 1982: 131.)

The retention of dental stops in the 知 series is by no means an exclusively Min feature. This feature also can be found in other dialects such as Wu, Pinghua of Guangxi, Xiang dialects of Hunan. Therefore, the mere presence of dentals in words of this type is not a sufficient condition for classifying a dialect as Min.

Another much discussed phenomenon that MC fricative initials correspond to affricate initials in the colloquial Min also can be found in other dialects. The easier discovered examples are the words 粹, 產 and 成 in Mandarin all pronounced as affricate initials ts, and tN. It is thereby not so unique in the reflex of \*s series. Besides, this feature is also shared by the Kejia dialect in Miaoli of Taiwan<sup>6</sup>. In addition, words of the 邪 initial are pronounced as those of the 從 initial in a large area of southern Chinese. It means that they are represented as affricates like /ts/. For instance, the initial of 松 is pronounced as affricate initials in colloquial stratum but as fricative initials in the literary stratum. This word can be found in Jiaying of Zhejiang, Xiuning of Anhui, Anyi of Jiangxi, Loudi of Hunan, Miaoli of Taiwan, and Lungsheng, Xongyiao, Younian of Guangxi. In examining the distribution of such feature as those given above, it implies that this feature pervades the southern dialects of Chinese and thus cannot properly serve to distinguish the Min dialect from other southern dialect groups.

The realization of 匣 as stop or zero initials is often considered a typical Min trait; but, as shown in a rich array of dialectal data, this is by no means an exclusively Min feature. The realization of a k initial can be found in Taojiang of Hunan, Anyi, Nanchang of Jiangxi. Besides, the realization of a zero initial is widespread in southern Chinese, such as Taojiang, Linwu, and Loudi of Hunan, Gaoan of Jiangxi, Taiping and Xiuning of Anhui, Lusi of Jiangsu,

## Dialect Mixture

Pingyang of Zhejiang, Nanning of Guangxi, and Miaoli of Taiwan.

Moreover, the representation of bilabial stops for initials 非, 敷, 奉 and 微 is not a unique Min character, either. This trait is also shared by Kejia and the scattered examples can be found in the dialects of Yue, Wu, Xiang.

Based on the fact that the remarkable Min characteristics also are revealed by other dialects, we attempt to list six<sup>7</sup> criteria for classifying various dialects in the table below: the mark of " + " indicates the presence of the feature in that dialect.

	Min	Gan	Kejia	Wu	Xiang	Guangxi	Yue
*t: t, th <sup>8</sup>	+	+		+	+	+	
*tʂ: k <sup>9</sup>	+		+				
*s: ts <sup>10</sup>	+	+	+	+	+	+	+
*ɹ: k <sup>11</sup>	+	+			+		
*ɹ: φ <sup>12</sup>	+	+	+	+	+	+	
f: p, ph <sup>13</sup>	+	+	+	+	+		+

A cursory inspection of the table given above reveals that most of these features are very widespread in dialects outside the Min group, and that they are too general to be used as classificatory criteria. Indeed, even though some examples of the same development can be found in other dialects, it is nowhere nearly so prevailing as in Min. However, no single feature is sufficient in classifying various dialects. The classificatory criteria are comprised of a cluster of features only by which can we classify dialects into their respective groups.

Although some of characteristics of Min as listed above also appear in other dialects as well, none of them contains such a goodly proportion of traits as the Min dialects. Only the sum of all traits

is characteristic of Min dialects alone. Actually, Min dialects are composed of these features which demonstrate their uniqueness and the realization of these distinctive features are still noteworthy in classifying a dialect.

Another absorbing phenomena revealed by the dialect groups which share some of the features with Min is that most of them are located in southern China. It shows that these dialectal similarities cannot be accidental. Nonetheless, though we do not claim that features are as significant in other dialects as in Min, they do occur. They may well come about from a common origin and be rooted in a certain consistent direction of drift, whose speed varies depending on circumstances.<sup>14</sup> Therefore, the retention of archaic traits differs in varying degrees in each dialect; and there is reason to claim that the direction of change is not very different except in intensity in dialects. It points to the consistent direction of the sound change from a geographical point of view. There is a pervasive tendency to spread the same process of sound change over the large southern area.

With their outstanding traits, Min dialects retain more archaic forms than other dialects. Due to centuries of steady infiltration of northern features, dialects that once possessed archaic traits have strikingly reduced their range, thus leaving the Min dialects as representative of the earlier form at present. (Norman 1986: 16)

### **3. The Jianyang dialect**

Jianyang is a dialect of northwestern Min, or as it is of ten termed, Minbei. This area is located immediately to the south of Zhejiang and to the east of Jiangxi provinces. Therefore, some characteristics of the sound system may result from the influence

of the neighboring Wu and Gan dialects. We will deliberate on the evolution of sound change which may be induced by internal development or external influence.

### 3.1. The development of MC voiced stops

In this section, the evolution of bilabial and velar stops will be examined. It leads to the conclusion that both series of evolution have been implemented by the weakening process which refers to a sound made with a relatively weak degree of muscular effort and breath force. Moreover, bilabial and velar stops are more closely linked than the relation of each to dental stops. This intimate relation is established in accordance with the parallel process of development and the articulatory mechanism.

The sound systems do not have a labiodental fricative in most of the Min dialects. On the contrary, the labiodental fricative *v* which corresponds to MC \*b and \*m appears in JY. For instance:

*b(並)	敗vai	陰去	薄v0陽入	部vu陽去	枇voi	陽平乙
	瓶vai	ŋ 陽平甲		旁vou	ŋ 平甲	
*m(微)	物vui	陽入	文vu	ŋ 陽平甲	霧vu	陽去
					味	voi 陽去

In some cases of \*b and \*m, the dephonologization<sup>15</sup> is a correlative pair that results in the identity. It means that a correlative phonological distinction such as /b/ and /m/ is suspended, while the other pairs of consonants that make up the correlation of oral and nasal stops (/d/ : /n/; /g/ : /ŋ/) remain unchanged. (Jakobson 1978: 107) Whenever dephonologization, phonologization, or rephonologization<sup>16</sup> take place in the sound system, two kinds of the phonological oppositions must be considered. One is a disjunction and the other is a correlative opposition. The disjunction indicates there is only one pair of sound contrasted by the opposed feature in the sys-



tem. The correlative opposition, on the other hand, is proportional in the system because the distinctive feature that the two phonemes have in common also occurs in other phonemes. (Jakobson 1978: 105-109; Trubetzkoy 1969: 68)

With respect to this merger, the evolution of *v* may derive from \**m* in two steps: first, it is denasalized and then merges with \**b*. After the first stage of sound change, both sounds undergo the weakening process that changes stops into fricatives.

Moreover, /*v*/ as a reflex of \**b* may be a reinterpretation of the MC plain/aspirate/voiced contrast as an voiceless stop/voiced fricative contrast. Since the convergence of the MC plain/voiced contrast is in favor of the voiceless unaspirated stops in most of the Min dialects, the derivation of the voiced fricative in JY seems to show an attempt at maintaining the contrast by producing the new distinction.<sup>17</sup>

Velars in addition to bilabials also undergo the weakening process. Consequently, \**k* becomes /*x*/ in the initial 見. (Norman 1973: 229) In one sense, the zero initial reflex of the initial 群 as well as that of the other MC voiced initials also results from the weakening process. (See section 3.4 for detailed discussion)

Furthermore, we may postulate that the weakening process from /*k*/ to /*ϕ*/ has an intermediate stage represented by /*x*/. (Chang p.c.) This hypothesis can be exemplified in the evidence that the fricative *x* as a reflex of 見 as exemplified by 狗, 基, and 肝 is the vestigial form in the sound change. While most of the reflexes of 群 are /*k*/, some of the items have undergone the weakening process and thus velar stops become fricatives which then drop as a further step of sound change. This process shows the parallelism among bilabial and velar stops. In bilabial initials, the reflexes of

/p/, /v/, and /  $\phi$  / uphold the hypothesis that the weakening process may result in an intermediate stage, from which the merger of the sound proceeds stepwise.

The parallel development of bilabial and velar stops (p-v-  $\phi$  ; k- x-  $\phi$  ) can be explained by acoustic phonetics. Bilabial and velar stops share an acoustic property which does not occur in the dental stop. Since labial and velar sounds are articulated at the peripheries of the oral cavity, a concentration of energy in the lower frequencies of the sound spectrum is produced by them. The dental sound, contrary to [p] and [k], produces a concentration of energy in the upper frequencies of the sound spectrum. These acoustic distinctions are incorporated into distinctive phonological features of grave and acute. The property of gravity is shared by labial and velar and that of acute by dental sounds. (Hyman 1975: 31; Jakobson & Halle 1956: 43) Consequently, it is evident that the parallel developments of \*b series and \*g series can be accounted for by a cogent acoustic reason.

### **3.2 The reflections of MC voiced obstruents**

Most disputed arguments about the earlier reflex of voiced obstruents fall into two general hypotheses: either the unaspirated or the aspirated ones represent the earlier stratum. To put this question in a proper perspective, we spell out the development of voiced obstruents in JY. The following table shows the correlation among the tonal behavior and the presence of aspiration for the reflexes of MC voiced obstruents.

Tsing Hua Working Papers in Linguistics

	MI	even	oblique	MI	even	oblique
	並(*b)			定(*d)		
aspirated	ph	5	6	h/th	6	1
unaspirated	p	11	14	t	7	14
	群(*g)			澄(*d)		
aspirated	kh	1	1	h	3	2
unaspirated	k	19	15	t	7	10
	從(*dz)			崇(*dz)		
aspirated	tsh/th	4	1	th/h/kh	3	2
unaspirated	ts/k	6	4	t	0	1
	船(*dʒ)			邪(*z)		
aspirated	tsh	0	1		0	0
unaspirated	ts	0	1	ts	1	1
	禪(*ʃ)					
aspirated	tsh	0	1			
unaspirated	ts	1	2			
			even	oblique		
total			77	77		
rate asp.			28%	20%		
unasp.			72%	80%		

Based on the tonal behavior of northern dialects, there is a classical criterion of aspiration in voiced initial stops and affricates, which can be used to distinguish between the colloquial and literary pronunciations. The criterion indicates that MC voiced stops and affricates were all devoiced, becoming aspirated in the level tone, unaspirated in the oblique tones in Mandarin Chinese. In JY, the above table shows the development in the even and oblique tones with the presence or absence of the aspiration. A ball-park statistical figure is that of a total of 77 words with MC even tones aspirated forms constitute 28%, unaspirated forms make up 72%. As

Dialect Mixture

for that of a total of 77 words with MC oblique tones aspirated forms constitute 20%, unaspirated ones make up 80%. The figures given above illustrate the general tendency to merge the MC voiceless/voiced contrast into voiceless unaspirated stops. In this respect, JY as well as other Min dialects undergoes similar developments. However, the aspiration in words with oblique tones may arise under extensive interference from the neighboring Gan dialects.

Cases of words with oblique tones came out as aspirated initials such as listed below may provide examples that resulted from language contact with Gan dialects.

	鼻	電	抱	被	部	辦	壘	柱
JY	ph	ph	ph	ph	ph	ph	h	h
Fuzhou	ph	ph	p	ph	p	p	th	th
Xiamen	ph	ph	ph	ph	ph	p	th	th
	杖	賊	柿	白	市	樹	稊 <sup>18</sup>	
JY	h	tsh	kh	kh	tsh	tsh	tsh	
Fuzhou	th	tsh	kh	kh	tsh	tsh		
Xiamen	th	tsh	kh	kh	tsh	tsh	tsh	

In addition, the word 鼻 has two ways of pronunciation in Chinese dialects. The unaspirated one in the ru tone represents the literary pronunciation which appears in Northern dialects, Lianshei of Jiangsu, Changsha of Hunan, etc. The aspirated one in the qu tone which represents the colloquial form appears in Jiangxi and its neighboring areas. (Chang 1990b) This word in Shaowu, Guangze, and Jianning as well as JY takes on an aspirated stop initial. Another interesting word is 賊 which is pronounced as an aspirated stop or an affricate in the northwestern Min including JY, Jian'ou, Chongan, Songxi, Pucheng, Zhenghe, Jiangle, Shunchang, Shaowu, Guangze, and Jianning.

The examples of JY as well as other Min dialects lead us to assume that the appearance of aspiration may be due to the extensive influence of the neighboring Gan dialects.<sup>19</sup> Because in Gan and Kejia dialects, MC voiced stops and affricates become aspirated voiceless initials in all tones. In this sense, JY is saturated with characteristics of Gan dialects. According to the geographical distribution of these aspirated sounds, we can assume that the aspirated obstruents in JY have had its initial impetus from the encounter of JY and Gan. The resulting tendency also gradually diffuses into the neighboring dialects of Gan. This hypothesis can be further supported by the evidence in Huizhou dialect. From the history of immigration it is attested that the unaspirated form represents the old stratum, while the aspirated one is influenced by the Gan dialects. Moreover, the comparison of the number of the aspirated obstruents in oblique tones in Huizhou and Min dialects shows that the former is larger than the latter. This may have to do with a difference in the geographical distance between JY/Huizhou, and Gan dialects. (Hirata 1982: 40) The phenomena exhibited in Huizhou and Min dialects indicate that southern dialects are influenced by Gan dialects in a very ancient period. In the literature, there is a hypothesis that the phenomenon might stem from a substratal influence. These two theories have been brought forth to explain the voiceless aspirated reflexes of MC voiced initials. (Chang p.c.)

### **3.3 *th* corresponds to *h* and *tsh* corresponds to *th* in JY**

After a perusal of our materials, we find out interesting distributions of /h/, /l/, and zero initial. There are two remarkable rules of sound change in JY. (1) *th* shifts to *h*, and (2) *tsh* becomes

*th*:

rule 1 *th*----> *h*

rule 2 *tsh*----> *th*

Major sources of glottal fricative /h/ are the aspirated dental stops which derives from MC \**th*, \**d*, \**tʰ*, and \**d̥*, etc. The other source of /h/ comes from \**ɣ*. These disjunctive sources involve dephono-  
logization.

JY reflex [h] of MC initial

MC initial	數	透	定	徹	澄	初	崇	匣
	*ph	*th	*d	*tʰ	*d̥	*tʃh	*dz	*ɣ
reflex	訃	脫腿通挑	疊啼	煙	柱	窗	事	會隍
	番	鐵土踢偷	頭	抽	槌			核胡
		帖套廳貪	桃		杖			盒鉗
		桶荆天討	桐		錘			覓行
		毯吐湯	糖		蟲			蟹

/h/ as a reflex of MC initial categories 透 and 定 is an areal feature. This can be detected in Nancheng, Nanfeng, Xiajiang, Lichuan, Fengxin, Youxian, and Linchuan of Gan dialects. In addition, it also occurs in Thaishan, Siyi, Domen, Jiangmen, Xinhui, Kaiping, Enping, Heshan of Yue; Tanchou, Wenchang of Hainan, and Haiko of Min dialects. (Yang: 1982; Luo: 1958; Ho 1988: 104; Huang & Li 1987: 273; Ting 1986: 133-4; Zhan & Cheung. 1987) Jiangxi is located in the northwestern part of JY; therefore, the realization as /h/ is not a peculiar phenomenon which may stem from the language contact.

Another specific sound change rule possessed by JY which derives *th* from *tsh* is actuated in the initials 清 and 從. And it also can be found in the neighboring Gan dialects such as Fengxin, Nancheng, Nanfeng, Lichuan, Yiuxian, and Xianning. Meanwhile,

Taishan, Kaiping, Heshan and other Yue dialects in Guangxi province also share this reflex with JY. (Yang 1982; Ho 1988: 104; Zhan & Cheung 1987) The phonological rule is given as follows:

\*tsh ----> tsh / \_\_ i, y  
----> th / elsewhere

Based on this representation, we find that [tsh] is unchanged when followed by the high front vowels; and it merges into [th] in the condition other than high front vowels. Whereas secondary [th] derived from this rule may coalesce into the primary [th] which appeared in the initials 透, 定, 徹, and 澄; the primary [th] proceeds in the on-going change from voiceless aspirated initials to a fricative [h]. The formation of the string *tsh-th-h* may be accomplished either by a push chain or a drag chain.

As a consequence of the fact that the secondary [th] is seldom confused with the [h] which represents the original \*th, the change of /tsh/ to /th/ may be a later development. After the primary [th] shift to [h], the resulting imbalance of phonological system lack [th]. In order to compensate for the gap left by [th] and thus to maintain parallel structure, [tsh] becomes [th] if it is not followed by high front vowels. The clearest phonetic changes in these rules, (one is \*th and \*d became *h*, the other is \*tsh and \*dz going to *th*), are phonological ones involving phonemic mergers. In this respect, they can be called dephonologization, which indicates the suppression of a phonological distinction. (Jakobson 1978: 105)

In respect to the nature of these two rules, they exhibit two opposite developments. One undergoes the weakening process which shifts stops to fricatives, and the other, the opposite strengthening process which changes affricates to stops. The clear illustration of these development is as follows:

### Dialect Mixture

	stop	:	affricate	fricative
unchanged	th	:	tsh	
changed R1		th	----->	h
	(*th, *d series) weakening <sup>20</sup>			
R2	th	<-----	tsh	(*tsh, *dz)
	strengthening			

In this case, the opposition between stops and affricates is transformed into an opposition between fricatives and stops. This is one of rephonologization that change one correlation to another correlation. (Jakobson 1978: 109-111) In other words, these two processes of sound change reinterpret a stop/affricate contrast as a fricative/stop contrast, with an attempt at maximizing contrasts between \*th, \*d, \*ʈh, \*ɖ and \*tsh, \*dz.

Since these two phonetic rules are considered as areal features that appear in Gan, Yue, JY, and extend to Haiko of Min dialects, these dialectal similarities which have developed close ties cannot be accidental.<sup>21</sup> The main stimuli for the operating of these rules may be drift or dialect interference. Since all dialects change through time, they shift in a certain way to counterbalance the structure of languages. In this case, the application of these two rules arises from internal as well as external factors. (Thomason & Kaufman 1988: 9)

#### 3.4 Zero initial and lateral l correspond to MC voiced initials

The zero initial in colloquial stratum in JY comes from MC voiced initials which involves two groups: one is \* ɣ , and the other includes \*b, \*m, \*dʒ, \*ʒ, \*g.

JY reflex [  $\phi$  ] of MC initial



Tsing Hua Working Papers in Linguistics

MC initial	並	奉	微	船	禪	群	疑	匣	日	云	以	影
	*b	*b	*m	*dʒ	*ʒ	*g	*ŋ	*ɣ	*nʒ	*j	*ji	*ʔ
reflex	罷菩	房	萬	射	社	騎	蟻	話禾黃	耳	兩	癢	衣
	簿菔		味	船	上	喬		早胡禾	閏	etc.		
	便盆		圍	蛇	嚙			會行丸	熱			
	排蒲		文					行完	禡			
	盤							喉礪	絨			
	牌							鬪行				

Lateral l used as colloquial pronunciation in JY comes from MC voiced initials: \*d, \*dz, \*z, \*d, \*dz, \*dʒ, \*ʒ

JY reflex [l] of MC initial

MC initial	定	從	邪	澄	崇	船	禪	泥	來
	*d	*dz	*z	*d	*dz	*dʒ	*ʒ	*n	*l
reflex	堂弟袋杜	在層	松	趙除	劍	舌	植	暖	老, etc.
	徒動銅甜	造存		值池	閏	剩			
	道地亭桃	雜裁		痔	狀	神			
	蝶稻淘檣	字財		苧	查				
	毒袋童台	存磁		重	鋤				
	特隊投停	罪材		場					
	淡代舵棠	齊裁		捷					
	塗同第痰	全		場					
	圖唐潭長								

In examining such forms as those given above, it is evident that there is a growing tendency to merge MC aspirated initials into *h*, and voiced initials tend to become *l* and  $\phi$ . It seems that the evolution of MC voiced and voiceless initials is closely linked with the manners of articulation rather than the places of articulation. In respect to the parallel mergers between  $\phi$  and *l*, it follows that bilabial and velar stops undergo the same process of weakening; while dental stops and sibilants are actuated by the outgoing air channel switch.<sup>22</sup> Thus, the

convergence of voiced initials to  $\phi$  and  $l$  and that of aspirated initials to  $h$  seems to show an attempt to minimize the contrast caused by different places of articulation. This assumption can be well attested by other dialects. The merger of voiced obstruents can be found in Yiyang, Luxi and Waxiang of Xiang dialects. The same has occurred in Ling dialect of Guangxi province. Meanwhile, the merger of aspirated initials which is an areal feature can be found in Gan and Haiko dialects.(Li 1985; Chen 1981; Yang 1982; Chang 1990a) The convergence found in these dialects points to a common drift waving in the southern area

From the view of language contact, we detect that /h/ in the reflex of 透 and 定, and /th/ of 初, 崇, and 昌 are features which also can be found in a host of Gan dialects. (Yang 1982) These phenomena substantiate the theory of language interference. The dialects of Nancheng, Nanfeng, Xiajiang, and Lichuan in the eastern Jiangxi province share with JY the changes from /th/ to /h/ and from /tsh/ to /th/. Geographically speaking, these counties are located immediately to the west of Fujian. Communications within these areas and JY are not difficult, and as a result localities have more frequent contact. In view of cross-dialectal interference, outside influences seem to have penetrated rather easily into JY. And consequently sound systems of JY show an complicated phenomenon.

With respect to the parallel mergers of the MC voiced obstruents into /l/ and /  $\phi$  /, this evolution as well as the merger of the MC aspirated initials can be exemplified in other dialects. As to the problem of sorting out the origin of spreading, sometimes we can establish directionality for local diffusion, but often we cannot. In the case of aspirated reflexes for MC voiced obstruents, the initial impetus is rooted in Gan and then spreads throughout other

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dialects. The postulation is upheld by the development of its neighboring dialects which point in this direction. On the contrary, as in cases in the shift of MC aspirated initials to /h/ and the convergence of MC voiced obstruents to / $\phi$ / and /l/, the directionality of transformation is quite hard to figure out. Nevertheless, we can tentatively assume that the aspirated reflexes of the MC voiced words with oblique tones, the merger of MC aspirated initials, and that of MC voiced obstruents illustrate the growing tendencies of sound change in southern dialects.

#### 4. Conclusion

After having described several prominent phonological changes in JY, we will summarize the restructuring of initial system in Jakobsonian terms. The reflex of /h/ in JY comes from two sources: one is a glottal fricative \* $\gamma$ , and the others come from aspirated dental stops like \*th. This is a dephonologization of disjunctive relation that results in the identity. Before the operation of rule 1, dental stops and velar fricative share no common feature. But later, the secondary /h/ derived from aspirated initials merge with the primary /h/, a reflex of the initial \* $\gamma$ .

As for the initial development from MC to JY, one important phonological mutation is the rephonologization that the phonological structure of oppositions are rearranged after the application of sound change. In the case of the development of MC voiced stops, the phonological mutations are rephonologization, including b--> p, ph, v; d--> t, h, l; g--> k, kh. The voiced bilabial and velar are correlation that results in another correlation. They both merge with voiceless aspirated and unaspirated stops. The change of \*d, which is correlated with \*b and \*g, to /t/, /h/, or /l/ results in a disjunction.

There is no longer correlation between t/h/l (acute) and p/ph/v, k/kh (gravity). Furthermore, the distinct behavior of sounds with grave and acute features also can be detected by the tendency that \*b and \*g become zero initials while \*d becomes a lateral /l/. This is a phonological mutation with correlative pairs that results in a disjunction. Except for the plosives (\*d, \*d), the voiced fricatives (\*z, \*z) and affricates (\*dz, \*dź, \*dz) that have acute feature in common also become a lateral /l/. Therefore, the distinctive features of acute and grave play a crucial role in the development of the initials of JY. Concerning rules th-->h; tsh-->th, they results in a rephonologization that transforms the opposition between stops and affricates to a fricative/stop contrast. (Jakobson 1978: 109-111)

Since these processes are global tendencies in the development of sound systems, we may regard the intriguing phenomenon as the result of system-internal as well as an external development. The consequences of these processes are the various reflexes for the MC initials and the merger of some phonemes. For the purpose of keeping the new distinction, the old and the new series repel each other in phonological space, producing the new contrasting system. While these changes may be initiated by the external contact with the neighboring Gan and Wu dialects or by the internal natural development of sound, the resulting tendencies spread throughout the large area of southern China.

One important claim that phonological change of all sorts do diffuse to neighboring dialects is attested by the clearest examples in other dialects as those given above. (Thomason & Kaufman 1988: 16) The process of phonological change is not very different except in intensity in dialects. In dialects outside the Min group, the appearance of many of the typical Min features could have arisen

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spontaneously through drift. There are evidently some general tendencies that eventually drive southern dialects along closely parallel paths. Therefore, in this case, internal as well as external factors should be taken into consideration in accounting for them.

The difficulties which we always confront in sorting out the place of JY among the Min dialects are their mixed nature and the directionality for local diffusion. There are no clearcut dialect borders in this contact situation. It is thereby especially hard to decide which trait is indigenous and which one is a later accretion. In fact, the result in working out the original characteristics of JY will in a sense be a kind of mixed dialect, containing elements from both of the strata described above and from the continuous interaction with neighboring dialects. In effect all languages are mixed to some degree since probably all have undergone considerable foreign interference in the course of their formation. Therefore, we should not regard JY as something special in this respect. (Norman 1986: 17) Due to its several phonological peculiarities, JY clearly forms a subgroup within northwestern Min, which is a transitional region between typical Min and Gan dialects. Therefore, JY possesses many similar features of them.

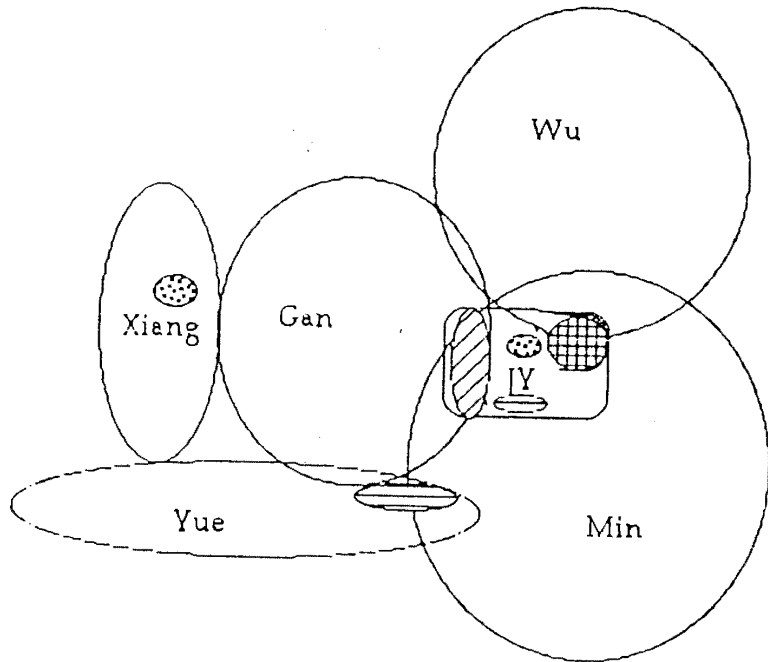
Meanwhile, disregarding the intimate interaction between dialects can hardly account adequately for the extraordinary complexities of the mixed dialect situation. Therefore, our attention is not only focused on the development of JY but also on the similar representations in other dialects. Since we discover that many of the typical Min features also appear in other southern dialects, it implies that these features are either all inherited in Min or develop through drift, via evolution whose seeds may be scattered in the large southern area.

## Dialect Mixture

With a thorough examination of our materials, we find that the outstanding characteristics of JY are composed of typical Min traits and some non-Min traits. These complicated phenomenon can only be explained by the combined interaction of internal and external factors in forming a dialect. JY possesses several indisputably Min traits. (see features 1-6) On the other hand, JY has some features which are also found in other dialect groups to some degree. Features 7-9 indicate that JY possesses some characteristics which are seldom exhibited in other Min dialects. However, they appear in its neighboring dialect. We speculate that language contact results in the composite nature of the initial system of JY. In comparison with other dialects, we illustrate these features which uphold our claim of dialect mixture and that a dialect can be adequately identified by a cluster of phonological features, but not a single criterion:

	S.Min	JY	Gan <sup>23</sup>	Wu <sup>24</sup>	Xiang	Yue
1 *t̥: t, th	+	+	+	+	+	
2 *tʂ: k	+	+	+			
3 *s: ts, tsh	+	+	+	+	+	+
4 *ɾ: k	+	+	+		+	
5 *ɾ: $\phi$	+	+	+	+	+	
6 f: p, ph	+	+	+	+	+	+
7 *l: s <sup>25</sup>		+	+			
8 th: h; tsh: th <sup>26</sup>	27	+	+			+
9 *vd obstruents: l, $\phi$ <sup>28 29</sup>		+			+	

In summary, a table is provided to show the interaction of southern dialects which are closely tied to JY.



indicates the features shared by JY and Wu



indicates the features shared by JY and Gan



indicates the features shared by JY and Yue



indicates the features shared by JY and Xiang

## NOTES

\* This paper is a summary of my MA thesis which is initiated by Professor William S. Y. Wang's course lectured in the fall of 1988. The term paper in that course is expanded into my MA thesis. I am indebted to Professors Chin-fa Lien and Kuang-yu Chang. They brought me into the field of areal linguistics, provided constant guidance and encouragement. I also thank Professors Shuan-fan Huang, Kun Chang, and Dah-an Ho for their invaluable advice and discussion.

- 1 The idea of sorting out the development of a dialect from a geographical viewpoint was first inspired by Professor William S. Y. Wang in 1988. Later on, I concentrate on this main issue in dealing with the problem of language contact which results in the dialect mixture.
- 2 We adopt the data provided by *Minbei Fangyan Cihui Duibi Shouce*; in addition, the material of Norman 1969 is cited for reference. One of the major problems we confronted in analyzing the data is that the consensus of transcription is not easy to get, due to different informants and recorders.
- 3 Here the periodization of the Chinese language proposed by Wang (1958: 32-35) is adopted. In his theory, Old Chinese covers the periods up to the third century A.D. and Middle Chinese extends from the fourth century to the twelfth century A.D.
- 4 Middle Chinese initial categories are normally based on the Guangyun.
- 5  $\phi$  is used to represent a zero initial.
- 6 The appearance of Miaoli of Taiwan hereafter indicates the Kejia dialect in that region.
- 7 Instead of eight Min characteristics, we list six criteria which can be correlated in other dialects.



- 8 This criterion indicates the \*t̚ series is realized as dental plosives.
- 9 This criterion indicates the \*t̚s series corresponds to a voiceless velar stop /k/.
- 10 Actually this criterion indicates the \*s series fricative representations correspond to affricates including ts, tsh, tc dz, dz. The use of s: ts as a coverterm is only for convenience.
- 11 This criterion indicates the \* ɣ series corresponds to a voiceless velar stop /k/.
- 12 This criterion indicates the \* ɣ series corresponds to a zero initial.
- 13 This criterion indicates the 非 series corresponds to voiceless bilabial stops /p/, /ph/.
- 14 Sapir (1921: 171) proposed the idea of drift. I think the idea of drift can be applied to explain the similarities in southern dialects.
- 15 Dephonologization is the suppression of a phonological distinction. For instance, A and B are opposed phonologically, but between A1 and B1 such a phonological difference does not exist. (Jakobson 1978: 105-106)
- 16 Rephonologization indicates the transformation of a phonological distinction into another phonological distinction with a different relation to the phonological system from the first. For instance, "A and B as well as A1 and B1 are opposed phonologically, but the phonological structure of these oppositions is different." (Jakobson 1978: 109)
- 17 The idea to explain the appearance of /v/ in JY as the result of reinterpretation is initiated by Solnit (1982: 226-7).
- 18 We cannot find the pronunciation of 稊 in Fuzhou.
- 19 Min dialects are composed of many strata. One of them is the Ke-Gan (客贛) stratum. The major characteristic of this stratum is that the MC voiced initials become voiceless aspirated initials in all tones. The aspirated reflexes in Min

- dialects may be influenced by Gan dialects. (Chang 1990a: 188)
- 20 Weakening process refers to a sound made with a relatively weak degree of muscular effort and breath force while strengthening takes the contrary process.
- 21 Although this phenomenon appears in many dialects and cannot be used as a distinctive feature in classifying dialects, it confirms our supposition that JY is influenced by Gan from the geographical viewpoint.
- 22 This process is motivated by the intimate relation between the articulation of a sibilant fricative and a lateral. The articulation of laterals has to do with the configuration of the tongue such that the air comes over the sides rather than over the center of the tongue; while the airstream comes over the center of the tongue in articulating fricatives.
- 23 Since the classification between Gan and Kejia dialects is a controversial problem, we will not distinguish them for the convenient discussion as it is not our main topic.
- 24 Unlike southern Min, JY is probably linked with the Wu dialect in that the tonal category Yangping B may result from the close interaction with Wu dialect.
- 25 This criterion indicates that \*l initial is realized as /s/.
- 26 This criterion indicates that /th/ shifts to /h/ and /tsh/ to /th/.
- 27 No other southern Min dialects except those on the Hainan island exhibit this feature.
- 28 This criterion indicates that MC voiced initials are frequently merged into /l/ or /  $\phi$  /.
- 29 In southern Min dialects, we find some instances of MC voiced obstruents become zero initials. For example, the word 餡 with the initial 匣 is realized as /ã/ in Chaozhou and Xiamen.

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# THE ASPIRATION OF QIE-YUN VOICED PLOSIVES

Hui Ying Liu

## 1. Introduction

### 1.1 The classification of Chinese dialects

For modern dialects, a commonly accepted classificatory scheme is based on Li Fang-gui's article (1937). The main criterion of classification is the evolution of Qie-yun voiced plosives (including voiced stops and affricates). In the framework of Li, all Chinese dialects were divided into nine groups. The nine groups are as follows:

- (1) Northern Mandarin.
- (2) Southern-west Mandarin.
- (3) Xia-jiang Mandarin.

The above three groups have the same type of evolution for Qie-yun voiced stops and affricates. The Qie-yun voiced stops and affricates all become voiceless and aspirated in the level tone (píng shēng) but unaspirated in the oblique tones (shǎng shēng, qù shēng and rù shēng). The classification of the three groups were based on the criterion of geography rather than the linguistic evolution.

(4) Wu. Qie-yun voiced stops and affricates remain voiced without aspiration in all tonal categories.

(5) Gan-Kejia. Qie-yun voiced stops and affricates become voiceless aspirates in all tones [1].

(6) Xiang. Qie-yun voiced stops and affricates are unaspirated in all tonal categories. As for the phonetic value of voicing, it is



preserved with various degrees in individual dialects.

(7) Yue. Qie-yun voiced stops and affricates become voiceless aspirates in the level tone but voiceless unaspirates in the oblique tones. In some cases, they become voiceless aspirates in the lower rising tone.

(8) Min. Qie-yun voiced stops and affricates become unaspirated voiceless stops in all tones [2].

(9) The ninth group is simply a group of dialects, such as Wan dialect, which can not be fitted into the other eight groups.

### 1.2 The types of evolution for Chinese voiced plosives

There are three different types of evolution for the Qie-yun voiced plosives which could be sorted out of the above scheme.

The first type is that Qie-yun voiced plosives remain voiced and without aspiration in all tonal categories. This type could be found in the dialects of Wu group and some individual dialects in central part and western part of Xu-nan province (Zhou and You , 1985). The second type of evolution operating in Mandarin and Yue group is that Qie-yun voiced plosives become voiceless aspirates in the level tone but voiceless unaspirates in the oblique tones. As for the third type of evolution, it could be found in Min group and some dialects of Xiang group where Qie-yun voiced plosives become voiceless aspirates in all tones.

### 1.3 The scope of the present study

There is a problem arises from the last two different types of evolution. The problem is raised as whether the Qie-yun voiced plosives had the aspirating characteristic. In the present study, we would like to review the contrary solutions proposed by Karlgren (1915-26 , 1923), Li Rong (1963), C. W. Lu (1940, 1947), Maspero

(1920), etc., whose texts are the most important investigations on the problem in question. Based on their results we would argue the problem and suggest one favorable answer to it. The Buddhist transcription systems sorted out by Li Rong (1963) and C.W. Lu (1940) will be the most important evidence to support our proposition. To decrease the complexity of our study, just the voiced stops (i.e. "Quan-zhou She-yin" hereafter, QZ) will be related to the argument. We would like to propose one problem in the fourth part of the discussion. The problem is related to the development of voiced stops in northern dialects. However, we would leave it open in our study.

## **2. The contrary solutions for the problem of aspiration**

The problem of aspiration of Qie-yun QZ has been so much interesting to many studies, for example, Karlgren (1915-26, 1923) Li Rong (1963), C. W. Lu (1940, 1947). However, their results are always contradictory.

### **2.1 The theories about the aspiration of Qie-yun QZ**

Linguists such as Karlgren (1915-26, p.p.252-253) claimed that it is impossible for unaspirated voiced stops to be transferred directly to be voiceless with aspiration. Consequently, they speculated that Qie-yun QZ must have been with aspiration. On the contrary, some other linguists argued against Karlgren's proposition. For example, Li Rong (1963, p.p.116-128) presented some pieces of evidence in his study and concluded that in the course of Qie-yun QZ becoming voiceless aspirates, they never were aspirated before devoiced.

## 2.2 The theories about aspiration of QZ in Archaic Chinese[3]

To evaluate the two contrast opinions on the aspiration of Qie-yun QZ, it would be necessary to clarify their original characteristic.

As we know, Chinese is an old language which has developed for more than three thousand years. Just like the history of Chinese language, the linguistic study began much early in China. In Han dynasty there were many books written exclusively for the study of word's meaning, such as Fang-yan, Er-ya, Shi-ming...etc. But there were no books exclusively for the phonology. Thus, for the modern linguists to reconstruct the Archaic Chinese (A.C., for short) which is assumed to be the oldest proto-Chinese is always indirect.

In the earlier study of A.C., the concentration is on the final system. Two classes of material are available. First one involves the rhymed phrases and the rhymed compositions which are the primary object of study. However, they can not provide any information about the A.C. initial system.

For the second class of material, it is the so-called "Xié-shēng Zì"[4]. Karlgren (1923, p.p.16-30) is the first scholar who outlined the general picture of A.C. initials based on the "Xié-shēng Zì". In his framework, there are two contrast series of QZ One is unaspirated and the other is aspirated. Only the latter is ancestry of Qie-yun QZ.

Since Karlgren, there have been theories proposed to modify his framework. Also based on the "Xié-shēng Zì", Wang Li's modification (1958, p.p.65-68) is that there are four QZ in A.C., i.e. /b' /, /d' /, /d/ and /g' / which are ancestral to Qie-yun QZ except /d/. For the reconstruction of Qie-yun QZ in A.C., both Wang and

Karlgren agreed that they were aspirated.

Another modification was made by C. W. Lu (1947, p.p.273-278). Lu claimed that Qie-yun QZ in A.C are much likely to be without aspiration rather than with aspiration. According to the rule of phonetic derivation sorted out of "Xie-sheng Zi", the Qie-yun QZ are interchangeable more freely with voiceless aspirates than with voiceless unaspirates. Lu's conclusion is that for most dialects, the Qie-yun QZ were unaspirated in A.C. and their original status should be denoted as /b/, etc. but not /b'/ etc..

Beside "Xie-sheng Zi", the material such as "Jia-jie"[5], "Du-ruo"[6], "Yi-wen"[7] and "Yi-du"[8] also are available to the study of A.C. initials. The general linguistic method is to find out certain pieces of evidence by regulating them to confirm the results from the studies of "Xie-sheng Zi". Based on "Yi-wen" and "Yi-du", He (1979) evidenced that Lu's theory is more compatible with the actual situation.

### 2.3 The difficulty in the field of phonetic reconstruction of old Chinese

Why we have solutions for the same problem, which are so contradictory to each other? As commonly known, since Qie-yun was completed, so many rhyme books[9] can be based on for linguists to reconstruct the old phonological system of Chinese. However, the phonetic detail provided by the rhyme books are limited. The difficulty of phonetic study based on them stems from the speciality of Chinese characters. It is commonly known that the most important implement for people in the world to record their speech is their characters. Unlike the characters used by western people, which are symbols indicating the pronunciation of speech, Chinese characters are graphic. The load of phonetic information is just

their secondary function. Although the dialectology has a lot of contribution to the reconstruction of phonetic values of old Chinese, still so much phonetic detail about the old Chinese can not be clarified or confirmed, one of which is the aspiration of QZ in old Chinese. That is why there is a dichotomy between the theories about the aspiration feature of Qie-yun QZ.

As for the difficulty which linguists have in the study of A. C., it stems from the restricted knowledge provided by the historical texts. There are two causes of restrictness. On the one hand, as I have stated above, Chinese characters are graphic and the load of phonetic informations is their secondary function. Therefore, the phonetic knowledge provided by the material such as "Xié- shēng Zi" etc. is very limited. On the other hand, the linguistic philosophy of A.C. is the record of word's meaning and there is no record of pronunciation. Because the phonetic informations provided by resource materials are so limited, there are many phonetic or even phonological details of A.C. which still can not be learned.

### **3. The investigation on the Buddhist**

#### **transliteration systems**

In table 1, the Sanscrit unaspirated QZ have to be transliterated by Qie-yun nasals. Therefore, Maspero interpreted Qie-yun nasals to be voiced oral consonants which could be denoted as /mb/, /nd/ and /ŋg/. In another study made by C. W. Lu (1940), Maspero's interpretation was supported by a table of transcription system sorted out of Hui-lin's I Qie Jing Yin Yi (慧琳, 一切經音義, 783 A.D.) [10] which represented the same system as Amoghavajra's. Lu's table is as follows:

The Aspiration of Qie-Yun Voiced Plosives

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Sanscrit      transliteration

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k	迦(上)
kh	佉(上)
g	我(上)
gh	伽(去引)
ng	仰(鼻呼)
t	多(上)
th	他(上)
d	娜(上)
dh	駄(去)
n	囊
p	跋
ph	頗
b	麼
bh	婆(去重)
m	莽(鼻聲呼)

(table 1: Amoghavajra's transliteration)

Maspero (1920) was the first western sinologist to point out that in the Tang's Buddhist texts, it is clearly indicated that the dialect on which the transcription of the Sanscrit alphabets was based could have been devoid of unaspirated QZ, but had aspirated ones. The evidence given by Maspero is the Amoghavajra's transliteration. A table of Amoghavajra's transliteration based on Maspero's evidence is as follows:

Sanscrit	transliteration	Qie-yun initial
g	我	疑
gh	伽(去聲重) falling, heavy	群
d	娜	泥
dh	馱(重) heavy	定
b	麼(無鼻音) without nasal	明
bh	婆(去重)	並

(table 2:Hui-lin's transliteration in 783 A.D.)

Table 2 indicates that Sanscrit /m/ was replaced by the character 麼 but Sanscrit /b/ was by 麼 with an annotation "without nasal sound".

The oralized nasals /mb/ etc. still remain in the modern dialects of Shan-xi province. In the present-day Southern Min dialect, the unaspirated QZ resulted from the sound change. Thus, Maspero's reconstruction of Qie-yun nasals indeed could be able to give the sound change a motivation (mb-->b, nd-->d and ŋg-->g ) [11].

$$\left[ \begin{array}{l} +\text{cons} \\ +\text{nasal} \\ (+\text{voiced}) \\ (-\text{cont}) \end{array} \right] \rightarrow [-\text{nasal}]/\_\_\_ \vee \left( \left[ \begin{array}{l} +\text{cons} \\ -\text{nasal} \end{array} \right] \right)$$

As for the Sanscrit aspirated QZ, they corresponded to the Qie - yun QZ in both two systems. This leads Maspero and Lu to conclude that Qie-yun QZ must have been aspirated in 8th century in the dialect which the Amoghavajra's transcription was based on. Since the locality of Buddhist transcription is always the political

and cultural center, we speculate that the dialect in question could have been the dialect in Chang-an (the capital of Tang Empire), Tai-yuan or Luo-yang.

In contrast to the system used by Amoghavrja's translation, an older system prevailed between 2nd to 7th centuries. In the older system, both the Sanscrit unaspirated and aspirated QZ were transliterated by Qie-yun QZ. Wherever a difference had to be made, the Sanscrit aspirated must be annotated with 重 which Maspero interpreted as "aspire", i.e., aspirated. Thus, Maspero concluded that Qie-yun QZ could have been without aspiration since 2nd to 7th centuries, but after the 7th century, a sound change in aspiration happened to the Qie-yun QZ.

While Li Rong (1963) insisted that Qie-yun QZ never were aspirated, Maspero's theory indeed can be confirmed partially by some pieces of evidence given by Li Rong. For example (quoted from Li Rong, 1963, p.p.119):

Sanscrit	ga	gha	da	dha	ba	bha
東晉法顯(417 A.D)	伽	重	陀	重	婆	重
		音		音		音
劉宋慧嚴(424-432? A.D)	伽		陀		婆	

(table 3)

One point made by Maspero in dispute is the point that the sound change of aspiration occurred after the 7th century. It was strongly attacked by C.W. Lu (1940). Lu's proposition is based on the transliteration of Sarvadurgatiparisodhana-asnisa-vijaya-dharani (佛頂尊勝陀羅經) made by Buddhapala's (佛陀波利) around 683 A.D.. The table quoted from Lu's paper (1940, p.p.5) could be



as an illustration for his point:

Sanscrit	transliteration	Qie-yun initials
g	誡	疑
d	槃 捺 爾 挪 訥	泥
dh	地 馱 弟	定
n	囊 寧 難(上)	泥
b	沒 冒	明
bh	婆 鼻 部 陸	並
m	銘	明

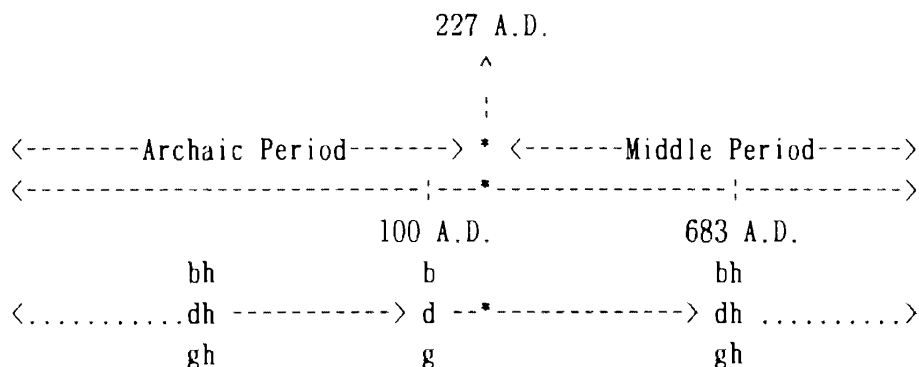
(table 4: Buddhapala's transliteration, in 683 A.D.)

Table 4 shows that the transcription system used by Budd. was already that of Amoghavajra. Thus, Maspero's theory needs to be modified. The time of transition in aspiration should have been at least one hundred years ahead of 8th century. It seems to me that the modified Maspero's theory is very persuasive and perhaps is true.

The Aspiration of Qie-Yun Voiced Plosives

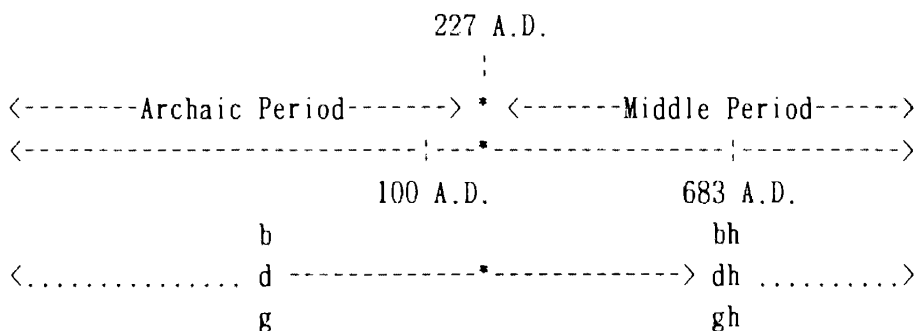
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Now, let's turn back to consider Karlgren's and Lu's theories of A.C. initials. If the modified Maspero's theory is true, then Karlgren's assumption that the prototypes of Qie-yun QZ were with aspiration implies the process of linguistic evolution represented as follows:



[FIGURE I]

The process illustrated by FIGURE I is phonologically impossible. On the other hand, C.W. Lu argued that Qie-yun QZ in most of the A.C. dialects were unaspirated. Therefore, the evolution of Qie-yun QZ must have been the following process:



[FIGURE II]

By comparing FIGURE I with FIGURE II, we could learn that Lu's argument is more compatible with Maspero's theory. The final

conclusion I would like to make here is that the original characteristic of Qie-yun QZ could have been voiced without aspiration but superimposed by the feature of aspiration in the latter time.

An interesting finding in Lu's study (1940) is that the older system represented by table 3 also was in use at the time of Budd.. The examples given by Lu (1940, p.p.10-11):

Sanskrit	transliteration	Qie-yun initials
g	伽(上) 伽,揭	群
d	地 地(上)	定
dh	姪(徒列反) 地(上重) 陀(重),陀 陀(上重) 提,提(重)	定
n	南,那,那(上) 爾	泥
b	勃,菩(長)	並
bh	婆(重) 婆(上重),薄 毘(上重) 菩(重) 鞞(重)	並
m	弭	明

(table 5:Du Xing-yi's 杜行 transliteration in 679 A.D.)

The Aspiration of Qie-Yun Voiced Plosives

Sanscrit	transliteration	Qie-yun initials
g	伽	群
d	伽(去), 揭	定
dh	侄 地, 姪 地, 陀, [駝] 馱, 馱(引) 陀(引) 陀(長聲), 提	定
n	那, 納 爾 那(引)	泥
b	菩, 辭, [勃] [蒲]	並
bh	婆, 婆(長聲), 薄 鼻, 毘, [苾] 部 鞞	並
m	弭	明

(table 6: Divakara's 地婆可羅 transliteration in 682 A.D.)

Sanscrit	transliteration	Qie-yun initials
g	伽, 揭, 虐	群
d	姪, 地, 啞	定
dh	地 馱, 陀, 陀(引) 睇	定
n	南, 那, 娜 爾 難(引)	泥
b	勃 菩	並
bh	婆, 婆(引), 薄 鞞, 毘 步 鞞(引)	並
m	弭	明

(table 7: Yi-jing's 義淨 transliteration in 710 A.D.)

Sanskrit	transliteration	Qie-yun initials
g	伽 揭, 竭	群
d	地, 姪	定
dh	地 馱, 陀 提	定
n	南, 那 爾	泥
b	喃 勃, 部	並
bh	婆, 薄, 幡(去) 鼻, 毘 部(引)	並
m	彌	明

(table 8: Subhakarasiṃha's 善無畏 transliteration in 717 A.D.)

The system represented by the above four tables had been used before the time of Budd. As indicated by table 3, the system in question had been used in the southern China of Nán-běi dynasty around the 5th century. In Nán-běi dynasty, the capital of Chinese empires always was built in Jiàn-yì --- the present day Nán-jīng, this older system could have been based on the Nan-jing dialect or Wu dialect.

Now, I would like to propose one possible interpretation for the different systems being used contemporarily. We have an example given by Li Rong (1963, p.p.119) which proves that until

The Aspiration of Qie-Yun Voiced Plosives

the invasion of northern China by five barbarians, Qie-yun QZ could have not aspirated in northern China (at least in the capital of West-jin --- Luò-yáng and its neighboring area). The example is table 9.

Sanscrit	ga	gha	da	dha	ba	bha
-----						
transliteration	迦	迦	陀	陀	波	披
(286 A.D.)	何		呵		何	

(table 9: Dharmaraksa's 竺法護 transliteration in West-jin dynasty)

The older system could have been established in the time of Dharmaraksa and based on the northern dialect.

When the barbarian carved the northern China into many states, the center of transliteration removed with Chinese government to the southern China. The aspiration of Chinese Qie-yun QZ could have occurred sporadically in some localities or even in a large area of the north which had been carved by barbarian. However, Qie-yun QZ could have been remaining unaspirated in Wu district. Therefore, in southern China, Chinese monks still used the older system to transliterate the Buddhist texts, which originally was based on the northern dialect before the collapse of West-jin dynasty.

After the northern barbarians were driven out by Tang Empire, the center of Buddhist transliteration removed northerly to Cháng-ān. Since that time, the older transcription system which was compatible with the southern dialect no longer was able to be utilized in the north and a new system would be needed.

Therefore, the system represented by the tables, such as table 2, was established in early Tang dynasty. For most of the Chinese monks could have been ignorant of Sanscrit, some of them could have been using the older system which had stood for a few

centuries. We would not exclude one possibility that the dialects of translators in early Tang dynasty could have behaved differently. For those who worked with the older system, they could have come from southern China and used the Wu dialect or the dialect similar to Wu dialect. As my opinion, the above speculation could have been a reasonable explanation for the new system and old system had been using contemporarily in early Tang dynasty till the last half of 8th century.

#### **4. The aspiration of QZ in northern Chinese of late Middle Period**

##### 4.1 The scheme of initials imagined by Shao Yung

As commonly known, the aspiration have been imposed on QZ in all modern northern dialects. The aspiration could already have occurred in Sung dynasty. In the book *Huang Ji Jing Shi* 皇極經世 written in 11th century, Shao Yung (邵雍, 1011-1077 A.D.) tried to give us what he imagined to be an ideally complete scheme of all the initials possible to human speech. In his framework, Qie-yun QZ had changed into voiceless aspirates in level tone, but voiceless unaspirates in oblique tones. Shao was born in Fan-yang which is near present-day Běi-jīng but lived in Luò-yáng for forty years. The schema presented by him must have represented the initial system of his native dialect and also Luò-yáng dialect in the late Middle Period.

However, another type of evolution indeed once existed also in the northern China of the late Middle Period, although it has been replaced in the later time by that operating in Běi-jīng or Luò-yáng dialect.

#### 4.2 The colloquial pronunciations in Shan-xi dialects

According to my investigation on a field work of Hong-dung dialect in Shān-xī province (喬全生, 1983), Qie-yun QZ become unaspirated in oblique tones and aspirated in level tone, just like the Běi-jīng dialect. However, we also find sporadic exceptional cases where Qie-yun QZ became aspirated in oblique tones. All these cases are colloquial pronunciations. For example,

lexical items	literary reading	colloquial reading	Qie-yun initials
辦			
伴	pan (陽去)	p'an	並母(去)
彈			
蛋	tan (陽去)	t'an	定母(去)
佃			
墊	tian (陽去)	t'ian	定母(去)
段			
斷	tuan (陽去)	t'uan	定母(去)
調	tiao (上)	t'iao	定母(去)

(table 10)

A similar result can be found in the study of Wang Hong-jun (1987). The object of his study is the stratum of colloquial reading in Wén-xī dialect of Shān-xī province. Wang's study shows that in the cases which belong to this stratum, Qie-yun QZ were aspirated not only in level tone but also in oblique tones. The colloquial readings in this Shān-xī dialect is believed by Wang to be the relics of northern-west dialects of Sung dynasty.



#### 4.3 The transliteration in a Chinese-Tangut vocabulary

Besides the two pieces of dialectal evidence, we also have a historical text which indicates that Qie-yun QZ actually had been aspirated in all tones of the northern-west Chinese in Sung dynasty.

A Chinese-Tangut vocabulary (掌中珠) compiled by Gu-le Mao-cai in 1190 A.D. was based on the northern-west Chinese dialects. According to Gong's study of this text (1979), the Tangut voiceless aspirates were transliterated by Chinese characters associated either with Qie-yun "Quán-zhuó Shēng-mǔ" (voiced obstruent initials) or with Qie-yun "Cì-qǐng Shēng-mǔ" (voiceless aspirates); the Tangut voiceless unaspirates, with Qie-yun "Quán-qīng Shēng-mǔ" (voiceless aspirates) and Tangut voiced stops as well as nasals, with Qie-yun nasal initials.

Gong's study shows that till 12th century, Qie-yun QZ had become to be aspirated and unvoiced in all tones in the dialects of northern-west China. Consequently, in the late Middle Period, there were at least two types of evolution which had happened contemporarily in different localities of northern China, although in the later time, the type operating in the present-day Shān-xī province has lost its effect and been replaced by the other type which operated in Bei-jing.

#### 4.4 An unsolved problem for the aspiration in northern dialects

The colloquial readings of Shān-xī dialects and a compilation of Chinese-Tangut vocabulary lead us to the conclusion that there were at least two types of evolution for Qie-yun QZ which contemporarily operated in different localities of northern China in the late Middle Period..

In Běi-jīng dialect, only the lexical cases of level tone were intruded by the change of aspiration. A possible explanation is that the permeation of aspiration started from the speech forms in level tone but it did not overcome the whole lexicon. The proceeding of permeation of aspiration to the forms with oblique tones was interrupted by the transformational process of devoicing.

The arguable point is whether the situation of aspiration of in Běi-jīng dialect could have implied the earlier step for the development of Qie-yun QZ in Shān-xī dialects, i.e. the Qie-yun QZ in northern-west dialects, such as Hóng-dòng and Wén-xǐ, had the change of aspiration only in level tone at first and then the change gradually prevailed in the other tones? A follow-up study would be expected to answer the question, but we would leave it open in the present study.

## **5. The relationship between Qie-yun language and Middle Chinese**

A commonly accepted notion is that the language recorded in Qie-yun is the Chinese language in the Middle Period, i.e., the Middle Chinese (M.C. for short) and all modern Chinese dialects are descendants of Qie-yun language. Now I would like to turn back to the two contradictory proposals based on this notion. As I have stated in the second part of the present paper, on the one hand, Karlgren insisted upon the reconstruction of aspiration for Qie-yun QZ. On the other hand, Li Rong disagreed with Karlgren's assertion and claimed that Qie-yun QZ never were aspirated. A noticeable point is that M.C. was equalized with Qie-yun language by Karlgren and Li Rong so that both of their theories are not only for QZ of Qie-yun language but also for that of M.C.. According to my

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conclusion in the third part of the present paper , the aspiration of QZ could have been quite different between dialects of the north and dialects of the south. Therefore, as my opinion, it is inappropriate for the students of Chinese linguistics to overlook the dialectal variations in M.C. and simply equalize Qie-yun language with it.

### 5.1 A statistic study of aspiration for QZ in Qie-yun language

To confirm the phonetic values of QZ in Qie-yun language, at this moment it may be better to leave aside the evidence based on the phonetic phenomena of modern dialects because the dialectal proofs separately given by Kargren and Li Rong are entirely contrary to each other.

Another method resorting to the statistics was used by C. W. Lu (1940,p.p.16-21). Lu's statistic investigation involved two kinds of materials. First is the phonetic component of Shuo-wen 說文. Lu compared the pronunciation of an original phonetic component and its derived characters according to Qie-yun and Guang-yun. Many characters recorded in Guang-yun could be read in at least two ways. The "double readings" of those characters are second part of Lu's materials. Lu's conclusion is that the QZ in Qie-yun language are more closely related to the unaspirated than aspirates. Thus, Qie-yun language could have been more closely related to the southern dialects, such as Wu, rather than the northern dialects , such as Chang-an. Because of the political factor, the official language of China was always the northern dialect in the capital city. We have enough reasons to consider the northern dialect of Chang-an as a representative of of M.C.. Obviously, language recorded in Qie-yun has a deviation from the "standard M.C."respect

of the aspiration of QZ. In their arguments on aspiration Qie-yun QZ, both Karlgren and Li Rong who equalize the Qie-yun language with M.C. seem to have made a methodological mistake.

Furthermore, as pointed by C. W. Lu (1940, p.p.14-15), Qie-yun is not an original work but only a compilation of still earlier texts and various bits of phonological material which had been accumulating since the Later Han dynasty; but the writers of Qie-yun doubtless had made a very accurate selection in most of the cases. Consequently, Qie-yun could have documented a great many speech forms in the times earlier than 601 A.D.. As I have argued in the third part of the present paper, QZ could have been without aspiration in Archaic Period so that the QZ in Qie-yun language were predominantly unaspirated. However, till the time of Qie-yun, they actually had been aspirated for some time in the northern dialects. So, if we want to select a set of symbols to characterize the phonetic values of QZ in Qie-yun language, /b/, /d/ and /g/ would be more appropriate; but if QZ in M.C., /b'/, /d'/ and /g'/ would be better.

## **6. Conclusion**

There are three series of QZ in the language recorded in Qie-yun. On the scheme presented by Li Fang-gui (1937), there are three evolutionary types of Qie-yun QZ which have been operating in different dialects. There are two proposals upon the process of the evolution. One of them speculated that Qie-yun QZ had been aspirated before they lost the voicing feature. The other supposed that Qie-yun voiced plosives never were aspirated before the process of devoicing occurred.

A notion which is commonly based on by the contrary theories proposed by Karlgren and Li Rong is that M.C. was equalized with

the language recorded in Qie-yun. Therefore, their propositions are not only for QZ of Qie-yun language but also for that of M.C.. As I have pointed, the notion is inappropriate because Qie-yun is not an original work but only a compilation of still earlier texts and various bits of phonological material texts and had been accumulating since the Later Han dynasty; but the writers of Qie-yun doubtless had made a very accurate selection in most of the cases. Consequently, Qie-yun could have documented a great many speech forms in the times earlier than 601 A.D.. Therefore, the nature of Qie-yun language could have been very similar to that of Archaic Chinese.

The results from previous studies (Maspero 1920, C. W. Lu 1940 and Li Rong 1963) have provided us a few systems of Buddhist transliteration. The systems enable us to evaluate the contrary solutions and find a favorable answer for the problem of QZ's aspiration. Our conclusion is that the original status of Qie-Yun QZ could have been without the aspiration in most dialects of Archaic Period. After the invasion of northern barbarian, QZ could have been changed to be aspirated in some dialect of the north, for example, the Chāng-ān dialect, in the time earlier than 7th century and then the aspiration feature could have spreaded itself over other dialects of the north gradually. However, the sound change of aspiration could have not happened in the southern dialects until the later time.

As for the QZ in Qie-yun language, on Lu's statistic study of phonetic component of Shuo-wen 說文 and characters recorded in Guang-yun which have "double readings", QZ of Qie-yun language are more closely related to the unaspirates than aspirates. Thus, the nature of Qie-yun language could have been much similar to the southern dialects in Middle Period or the Archaic Chinese rather

than the northern dialects or the so-called "standard M.C.", i.e. the Chang-an dialect.

we would not dare say that our conclusion of the present study has revealed the "actual situation" for the evolution of Qie-yun QZ in old Chinese. However, based on the conclusion, a very "possible" and "reasonable" process for the evolution of Qie-yun has been reconstructed in the last two paragraphs.

## FOOTNOTE

- [1] For classifying the Chinese modern dialects, the schemes presented by Ding (1982) and Yuan (1960) set off Gan and Kejia as two independent dialectic groups. On the other hand, Sagart (1985) argued that there is a close genetic relationship between Gan and Kejia. However, in this study, we would not concern ourselves with the problem of dialectal division.
- [2] Based on his vocabulary lists, Jerry Norman (1986, p.p.37) statistically evidenced that the aspiration criterion of Min group as given by Li (1937) is not accurate. On Jerry Norman, in each tonal category, there are between twenty and thirty percent of the words whose voiced initials become aspirated. The evolution of voiced initials in Min group is still a puzzle for students of dialectology. However, I would not try to clarify it in my study.
- [3] To discuss the problem in question more conveniently, we refer Wang Li's periodization (1958, p.p.35) and divide the whole history of Chinese into four periods as follows:
- (1) "Archaic Period" before the invasion of northern five barbarian in 3rd century. There is a transitional period between 3rd to 4th century.
  - (2) "Middle Period" till 12th century (i.e. about Southern Sung dynasty). There is a transitional period between 12th to 13th century.
  - (3) "Recent Period" including three dynasties: Yuan, Ming and Qing. The Opium War (1838-1840 A.D.) ended the period. There is a transitional period between 1840 A.D. to 1919 A.D. (i.e. the May Fourth Movement).
  - (4) "Modern Period" since the May Fourth Movement in 1919 A.D. till now. We define the Chinese performed in the Archaic Period as Archaic Chinese, in Middle Period as

Middle Chinese, in Recent Period as Recent Chinese and in Modern period as Modern Chinese.

- [4] One of the six groups of Chinese characters is the so-called "Xing-sheng Zi" (形聲字). This group of the characters is formed by a radical part which gives the meaning and the phonetic part which indicates the pronunciation. Given any two characters, if they have the same representation in phonetic part, such as the characters 墨 and 默; or if one of them has a phonetic part represented by the other, such as 黑 and 墨, then we could say that they rhyme with each other (同諧). A set of characters which rhyme with each other is the so-called "Xie-sheng Zi". The traditional view on "Xie-sheng Zi" is that their pronunciations could have the same initial sound or the initial sounds articulated in the same place of vocal tract.
- [5] "Jia-jie Zi" (假借字) is one of the six groups of Chinese characters. A character under this category is used with the sense which properly belongs to another of the same sound but different form.
- [6] "Du rou" (讀若) is a way to gloss the reading of a character. It is very popular for the scholars of Han dynasty. In the glossary of classic books, the Han writers usually gloss the pronunciation of a character through another one used more often and with a pronunciation similar to that of the glossed character. Take an example from Shou-wen (說文) for illustration: "蕙讀若蕙". In the example given here, 蕙 is a character used often than 蕙 and both characters have the same pronunciation.
- [7] In ancient China, a lexical meaning sometimes could be represented by different characters in different texts. For example, the lexical meaning could be represented by "時", such as Shang-shu 尚書: 時日何喪. The phrase was quoted by Shi-ji 史記 and written as 是日何喪. Traditionally, 是 and 時 are the so-called "Yì-wén". In general, "Yì-wén" have closely related
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pronunciations and they usually have the same phonetic part.

- [8] In classic books written in Archaic Period, we could find a group of characters whose pronunciations were indicated in more than one ways in Qie-yun. For example, the pronunciation of "旁" in the phrase "王事旁旁"(quoted from Shi-jing 詩經) was indicated as "步光切" and "布彭切". The case in which a character has more than one readings in Qie-yun, we call "Yì-dú" (異讀).
- [9] Rhyme books are the books which list characters grouped under various rhymes.
- [10] Hui lin is a faithful disciple of Amogharajra. The system of Hui lin's transliteration must have followed that of Amogharajra's.
- [11] As commonly known that Qie-yun nasals in most of the modern dialects have lost their oralized characteristic and become to be the "typical nasals"(m, n and ŋ). Due to this, the divergence of Southern Min from Sino-language must be a stage preceding the transition from the /mb/ etc. to the /m/ etc..

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