Fission Reduplication in Modern Chinese Dialects*

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1. Introduction

There is a common phenomenon in Chinese, from Old Chinese down through modern dialects, in which a monosyllabic word phonologically and semantically corresponds to a disyllabic word. Here are three examples from the Xin'an 新安 dialect: *tjəw*³³ 丟 'carry, lift'¹ $\leftrightarrow$ *ti*³³ *ljəw*⁰ 'lift (something to throw it away), detain'; 2) *təjəw*³³ 焦 'coke, burned things'; $\leftrightarrow$ *tci*³³ *ljəw*⁰ 'dregs of fat'; 3) *xuŋ*⁵³ 哄 'fool, humbug' $\leftrightarrow$ *xu*⁵³ *luŋ*⁰ 'fool, palm something off on'.² Scholars have been interested in this phenomenon for a long time, and they have identified many instances of it through history. Over the past several decades, the research on this phenomenon has progressed, not only in data collection, but also in attempts to account for the phenomenon. In my previous paper (Sun 2004), I dealt with the case in Old Chinese. The present paper aims at investigating and analyzing the same phenomenon in modern Chinese dialects. There are three objectives in this paper: the first is to analyze the data collected from modern Chinese dialects to explore the nature of this phenomenon; the second is to develop a generative theory of morpho-phonological interaction to account for the formation of this reduplication pattern, and the third is to make a comparison across modern dialects with respect to the form alternation.

2. The establishment of fission reduplication

The phenomenon under discussion is actually related to a type of reduplication that I

* This paper is one of the results of my project "Fission reduplication in modern Chinese dialects", supported by the Hong Kong University of Science and Technology (Project no.: DAG03/04.HSS01). I would like to thank Zev Handel and Douglas Whitehead for their checking over the English of this paper. Errors that remain are of course my own responsibility.

¹ This usage of 丟 can also be found in the Xiaoyi 孝義 dialect. See *Hanyu fangyan dacidian* [漢語方言大詞典] Vol. 2, P.2002.

² All data in this paper come from my fieldwork except where otherwise noted.

call fission reduplication. Let us explore this through some examples.

(1) Correspondence of monosyllabic form to disyllabic form in Shunping 順平

Monosyllabic form	Disyllabic form
a. tɕiŋ ⁵⁵ 驚 ‘startle’	tɕi ⁵⁵ liŋ ⁰ ‘startle (with physical reaction)’
b. tɕiŋ ⁵⁵ 精 ‘smart’	tɕi ⁵⁵ liŋ ⁰ ‘clever, nimble’
c. t ^h wo ⁵⁵ 脫 ‘take off (clothes)’	tu ⁵⁵ lwo ⁰ ‘(sleeves or trouser legs) hang loose’
d. t ^h wo ⁵⁵ 拖 ³ ‘drag’	t ^h a ⁵⁵ la ⁰ ‘slip on cloth shoes without pulling up the heels’
e. ts ^h a ⁵⁵ 擦 ‘wipe’	ts ^h ɿ ⁵⁵ la ⁰ ‘rub one’s shoe against something in order to remove dirt on it’
f. tɕ ^h ɣen ⁵⁵ 圈 ‘circle’	tɕ ^h y ⁵⁵ ljen ⁰ ‘(hair) curly’
g. po ⁵⁵ 撥 ‘move or adjust’	pu ⁵⁵ la ⁰ ‘repeatedly move horizontally’ with hand, foot, or stick’
h. pa ⁵⁵ 扒 ‘pull down’	pa ⁵⁵ la ⁰ ‘push slightly, repeatedly pull down’
i. pa ⁵⁵ 疤 ‘scar’	pa ⁵⁵ la ⁰ ‘scar (usually more than one)’
j. tɕa ⁵⁵ 渣 ‘dregs’	tɕɿ ⁵⁵ la ⁰ /la ¹⁰ ‘dregs of fat’
k. xwan ²² 環 ‘hoop, ring’	xu ¹¹ lan ⁰ ‘an area centered around the speaker’
l. xwo ²² 和 ‘mix (powder) with water’	xu ²² lwo ⁰ ‘to sweep powder together with hand, broom, and etc’
m. t ^h wan ²² 團 ‘something shaped like a ball’	t ^h u ²² lwan ⁰ ‘messy things shaped like a ball’
n. xwa ²² 劃 ‘cut the surface on’	xu ²² la ⁰ ‘scratch, scribble’
o. kɿ ²¹³ 葛 ‘coarse cloth’	kɿ ²¹ lɿ ⁰ ‘bib; (livestock) should pad’
p. ɕwo ⁵⁵ 說 ‘say, speak’	ɕu ²¹ lwo ⁰ ‘rebuke; reproach’
q. k ^h əw ²¹³ 口 ‘mouth’	k ^h ɿ ²¹ ləw ⁰ ‘(usually) back area inside of shoe’
r. tɕjaw ⁵¹ 叫 ‘cry, shout’	tɕi ²¹ jaw ⁰ ‘cicada’

For all the instances in (1) the common phonological properties are as follows: the onset of the monosyllabic form corresponds to the first syllable of the disyllabic form, the rhyme of the monosyllabic form corresponds to the second syllable of the disyllabic form, and the second syllable consistently presents a liquid onset. (On the tonal discrepancies, see below.) In (1a), for instance, the onset of the monosyllable tɕ- can be

³ Both t^hwo⁵⁵ 拖 and po⁵⁵ 撥 (1g) take -a- as their main vowel in Middle Chinese.

found in the first syllable of the disyllable and the rhyme of the monosyllable *-iŋ* can be found in the second syllable of the disyllable. Moreover, the second syllable of the disyllable has the liquid onset *l-*. Such a correspondence between a monosyllable and a disyllabic form is commonly attested in many cases. Thus it can be seen that it must reflect some type of linguistic mechanism. Below are several theoretical hypotheses concerning this correspondence phenomenon.

We may, at first sight, presume that the correspondence of this kind might originate from consonant clusters of Old Chinese—the insertion of the schwa *-ə-* between the two consonants such as **pl-*, **tl-*, **kl-*, **pr-*, **tr-*, and **kr-* could possibly cause the occurrence of a disyllabic form. To formulate this change, we have **CCVC* (monosyllable) > *CVCVC* (disyllable). This theory was firstly proposed by Boodberg (1937) and many scholars have followed him. Also some scholars have even taken this as evidence in favor of reconstructing consonant clusters in Old Chinese. There is every good reason to say that some disyllabic forms indeed resulted from the consonant cluster. For instance, *bǐ* 筆 **prət*⁴ (Li: **pljət*) has developed as *búlǚ* 不律 **pəʎ rwət* (Li: **pjəg bljət*) just because the schwa was inserted into the consonant cluster of the syllable **prət*. However, this dimidiation theory cannot be applied in most cases of this kind. The simple evidence for this argument is that most of the syllabic forms in question originally did not have a consonant cluster. For example, the forms *tʰwo*⁵⁵ and *xwo*²² (1d,l) can be traced back to **lwát* and **gwál* (Li: **rwat* and **gwar*) in Old Chinese, where we cannot find evidence of a consonant cluster. And the liquid *l-* in *tʰa*⁵⁵ *la*^o and *xu*²² *lwo*^o thus definitely could not be a residue of an Old Chinese sound. In addition, this dimidiation theory was established purely on a phonological basis and it failed to account for the semantic similarity and discrepancy between the monosyllabic form and the disyllabic form.

From a diachronic perspective, some scholars propose that the disyllabic forms already existed in ancient times. For instance, Sagart (1999) believed that *ka-lau?* in Xiamen 廈門 and *kaʔ-laʔ* in Pingyao 平遙 (both mean ‘fall down’) are residues of the sesquisyllable **^Akə-lak* of Old Chinese. It is true that the synchronic values could inform us of the diachronic development and these modern forms could be traced back to ancient times. However, even in ancient times it is still an issue that needs addressing, that is, we must explain how these disyllabic forms were produced. According to Liang (1982), in the Fuzhou 福州 dialect *ko*³¹ *lou*⁵⁵ ‘fall’ derives from *kou*⁵⁵ ‘slip’. Since *ka-lau?* in the Xiamen 廈門 dialect is much related to this disyllabic form and both dialects belong to Min, we can see that *ka-lau?* in the Xiamen 廈門 dialect should also have a corresponding monosyllabic origin. At any event, even if the modern disyllabic

⁴ Where necessary, the Old Chinese reconstruction forms, by Pulleyblank and Li Fang-kuei respectively, will be provided.

forms of this kind can be traced back to Old Chinese, the phenomenon still demands an explanation.

Explanations from a synchronic perspective are also diverse. Based on some examples, similar to those in (1), the Song scholar Hong Mai 洪邁 (1123-1202) came up with an explanation saying: 世人語音有以切腳而稱者，亦閒見於書史中 ‘In the language of contemporary people there are words formed in the way of “cutting foot”; some of them are also occasionally seen in historical texts.’ According to this understanding, the occurrence of these disyllabic forms seems to be simply because people wanted alternative expressions. This explanation is the same as the later account that these forms are originated from *fānqiè*. These explanations regard this language mechanism as a language game, ignore the grammatical motivation which triggers the occurrence of these disyllables, and therefore fail to catch the nature of this phenomenon.

In contrast to previous explanations, what Wang (1994) and Xing (2002) have advanced seems to get closer to the core of the issue. With the help of the model of reduplication with fixed melody in non-linear phonology, Wang believes that these disyllabic forms result from the mapping of the base rhyme onto an iambic foot of two syllables. This explanation is developed from the non-linear phonological theory and is quite enlightening. Nevertheless, what kind of semantic significance is involved in this process and how the phonological and grammatical components interact in the formation of these disyllabic forms still need to be further explored. As we know, reduplication is a kind of morphological mechanism which operates in a manner of repeating a form in order to express a new meaning. For example, in the Liquan 醴泉 dialect, the reduplication of a noun is conventionally employed to express a diminutive sense: *lu*⁴⁴ 路 ‘road’ → *lu*⁴⁴ *lu*⁰ ‘path’; *wān*⁵³ 碗 ‘bowl’ → *wān*²⁴ *wān*⁵³ ‘small bowl’; *fan*²⁴ 房 ‘house’ → *fan*²⁴ *fan*⁵³ ‘shed’. This example shows us that identification of reduplicated forms depends on both semantic and phonological evidence – we not only need to identify the regulated formal alternation, but also need to identify the semantic significance involved in this phonological process.

Take *t^hwo*⁵⁵ 脫 and *tu*⁵⁵ *lwo*⁰ (1c) for instance. We find, by comparing the two forms, that all the segments of the monosyllable can be found in the disyllabic form: *t^h-* and *-wo* can be seen in both ends of the disyllabic form. The same melodic materials seen in the disyllabic form result from the preservation of the components of the monosyllable during a particular process, and it is most suitable to assume that this process is reduplication. Of course there are some segments in *tu*⁵⁵ *lwo*⁰ which are not seen in *t^hwo*⁵⁵, such as *-u* in the first syllable and *l-* in the second syllable, but this is not something damaging to the reduplication hypothesis. Re-examining the examples in (1), we can see that the segments unseen in the monosyllable are not something disorderly

and unsystematic; rather, they present a strong inherent agreement: the first rhyme presents a strong tendency to be simple, and the initial of the second syllable is consistently a liquid. Given that disyllabic forms with different meanings share the same phonological properties, it is natural to speculate that these forms are not possibly protomorphs. They are most likely to be predictable products of reduplication. Actually the investigation of living languages has shown that reduplication indeed can produce fixed segments. In the Tengxian 藤縣 dialect, for instance, the reduplication of an adjective can give rise to a fixed rhyme -ɐŋ (Deng 1995). In Yoruba, reduplication carrying progressive aspect can bring about a fixed high vowel: *gbé* 'take' → *gbí-gbé* 'be taking'; *mu* 'drink' → *mí-mu* 'be drinking' (Pulleyblank 1988).

So far we have seen from the examples in (1) that all the segments of the monosyllable can be found in the corresponding disyllabic form and those unseen in the monosyllable are explainable. Therefore, there is every reason to believe these disyllabic forms result from reduplication. However, this case is phonologically and semantically different from total reduplication as seen in the Liquan 醴泉 dialect (see above). Also, it can be classified neither as retrogressive reduplication nor into progressive reduplication (Sun 1999). Moreover, the phonological alternation in this kind of reduplication can be characterized as the fission of one syllable into two syllables. Under such circumstances, reduplication of this kind should be otherwise named, and it is suitable to call it fission reduplication.

In addition to the phonological evidence, there is also semantic evidence in favor of this reduplication interpretation. In (1d) the two forms, *tʰwo⁵⁵* 拖 and *tʰa⁵⁵ la⁰*, roughly share the meaning 'to drag', differing only in connotation. The disyllabic form stresses the physical aspect, and it usually refers to dragging the shoes without pulling up the heels, while *tʰwo⁵⁵* is a general term mainly denoting a type of activity in general. Thus, in contrast to the meaning of the monosyllable, that which is denoted by the disyllabic form can be regarded as a specialized meaning. This semantic contrast is likewise applicable to all the other examples in (1). In (1c), *tʰwo⁵⁵* means 'take off (clothes)', a general sense, while the corresponding disyllabic form *tu⁵⁵ lwo⁰* means '(sleeves or trouser legs) hang down', a special sense. Look at another example, (1f). As opposed to the normal meaning 'circle' of the monosyllabic word *tɕʰɿɐn⁵⁵*, that which the disyllabic form *tɕʰy⁵⁵ lɿɐn⁰* expresses is '(hair) curly', a very special meaning.

After examining these examples, it becomes clear that the consistent semantic difference between the monosyllable and the disyllable can be identified as generalization and specialization; that is, the monosyllable expresses a general meaning while the disyllabic form expresses a special meaning. So far, we have seen that a regular phonological alternation carries a new meaning, and thus predictably there must be a common and characteristic morphological process involved in this phenomenon. It

is reasonable to identify it as fission reduplication.

Thus far, living examples have borne out the reality of fission reduplication. In addition to modern dialects, fission reduplication is also found in ancient Chinese. In discussing the historical origin of “A li AB”, Shi (2005) mentioned some fission reduplication examples such as *tɕy*⁵⁵ *ly*⁵¹ and *ku*³⁵ *lu*⁵¹ in Yuan.⁵ Old Chinese also possesses this morphological mechanism. Consider the examples in (2) below.

(2) Fission reduplication in Old Chinese (Sun 1999, 2004)

a. *tóu* 頭 **dáŋ* ‘head’ → *dúlóu* 髑髏 **dák*^u *ráŋ* ‘skull’

(Li: **dug* → **duk* *lug*)

b. *bīāo* 飈 **pjàw* ‘strong wind’ → *fúyáo* 扶搖 **bàŋ* *làw* ‘whirlwind’

(Li: **pjiag*^w → **bjag* *rag*^w)

c. *huò* 鑊 **wák* ‘caldron’ → *húluò* 瓠落 **wáŋ* *rák* ‘description of largeness in volume’

(Li: **g*^w*ak* → **g*^w*ag* *lak*)

These fission reduplication cases are highly consistent with respect to both morphology and phonology. From a morphological point of view, the semantic derivation from a monosyllabic base to a disyllabic fission reduplicated form can in all these cases be characterized as “specialization”. As far as the phonological components are concerned, the most significant characteristic attested in all these cases is that the original monosyllabic base is fissioned into two syllables. Thus the monosyllabic base can be restored by combining the onset of the first syllable with the rhyme of the second syllable in the corresponding fission reduplicated form. In addition, it is found that there are two kinds of phonological alternations that are common to all these cases: those realized in the onset of the second syllable and those in the rhyme of the first syllable. First, the liquid */- or */- always appears in the onset position of the second syllable in a fission reduplicated word. Second, a relatively simple rhyme occupies the rhyme position of the first syllable.

In the above discussion, we have seen many examples, from Old Chinese through modern dialects, whose semantic and phonological regularity convinced us that the proposal of fission reduplication is justified. Next, I will develop a generative theory of morpho-phonological interaction to account for the formation of this reduplication pattern.

⁵ Shi (2005) identifies this as dividing sounds to form new words.

3. The formation of fission reduplication

To advance a theoretical account for the formation of fission reduplication, we need to bring in two principles. One is language-specific and the other is cross-linguistic.

The first principle is called “One syllable/one meaning principle” (OOP; Sun 1999). This principle is based on the fact that in Chinese one morphemic meaning is generally denoted by just one syllable. In other words, Chinese basic vocabulary is monosyllabic in nature. This is a language-specific principle, which is applicable to Chinese.

The other principle is referred to as Sonority Sequencing Principle (SSP). (Kenstowicz 1994) This is a cross-linguistic principle (or at least a “strong tendency”), which is applicable to all the languages in the world. The sonority of a sound refers to its loudness in relation to other sounds with the same length, stress, and pitch. For example, let us pronounce three sounds *a*, *l*, and *s*. By using the same amount of energy, the three sounds are produced. But their acoustic impressions left to us are quite different; that is, *a* is much louder than *s*. *l* is intermediate in loudness. So, in accordance with their loudness or sonority, speech sounds can be scaled according to the manner of degree and they are basically classified into 5 grades: vowel > glide > liquid > nasal > obstruent.

Now let us have a look at SSP. The SSP is actually a definition for syllable, which means that the sonority of a syllable increases from the beginning of the syllable up to the peak, and decreases from the peak to the coda. So, with respect to the sonority of its segments each syllable can be represented by a peak-shape. Let us take the English word “glint” and the Chinese words *kwan*⁵⁵ 寬 ‘wide’ and *ljan*⁵¹ 亮 ‘bright’ as examples.

(3) Sonority curve of syllable

These three diagrams vividly depict SSP. Take (3a) for instance. “Glint” is composed of five segments, among which the vowel *i* presents the highest sonority thus

locating in the core position. Furthermore, the sonority of the front segment series “gli” increases while the sonority of the back segment series “int” declines. The same holds true for the other two (3b,c). The peak-shape representing the sonority curve conforms to people’s acoustic perception of syllables – even schoolchildren can count the number of syllables within a word just because they can discern sonority peaks. The application of SSP will help in exploring the internal structure of a syllable, predicting the development of a syllable and accounting for the alternation of segments within a syllable.

With these two principles, we can build a theoretical framework to account for how fission duplication is formed. Using concrete examples from the Chinese Xin’an 新安 dialect, the monosyllable $tɕ^h y^{33} ɿan^{33}$ 圈 is a commonly-used form, meaning ‘circle’. In correspondence to this monosyllable, the disyllabic form $tɕ^h y^{33} lɿan^0$ (also $tɕ^h y^{33} lɿɛu^0$) is also very common and its use is diverse. Here are some instances. When a student gets a zero in an exam, he/she may say with humor “I have eaten a $tɕ^h y^{33} lɿan^0$ (=circle = zero)”; a iron hoop, as a toy played by children, is called $tɕe^{33} tɕ^h y^{33} lɿan^0$ ($tɕe^{33}$ means ‘iron’); after having been out for a walk, the person could say “I have just now walked for one $tɕ^h y^{33} lɿan^0$ (taken a stroll)”. In comparing the monosyllabic form and the disyllabic form, we can see the meaning expressed by the latter is more concrete and special. As for the phonological contrast between them, what we can see is the same as seen in previous examples. All these characteristics meet the requirements for fission reduplication, and as a result, $tɕ^h y^{33} lɿan^0$ should no doubt be classified into this reduplication category.

Now we will show the process of how the fission reduplication word $tɕ^h y^{33} lɿan^0$ is formed. To get a form for a new special meaning, the Xin’an 新安 people start to work on the basis of the monosyllabic form $tɕ^h y^{33} ɿan^{33}$ that has such a general meaning as ‘circle’, taking this as the base for further reduplication. In view of the significant phonological difference between $tɕ^h y^{33} ɿan^{33}$ and $tɕ^h y^{33} lɿan^0$, as well as the fact that total reduplication is the typical type of reduplication, we can claim that, at least from a theoretical point of view, fission reduplication is not a one-step process, and the first step should be total reduplication.⁶ In line with this, we have (4).

⁶ Cf. Steriade (1988) and Sun (1999).

(4) The first stage of fission reduplication

$t\phi^h \eta an^{33} t\phi^h \eta an^{33}$ is a reduplicated form, and by convention it seems appropriate to carry the new specialized meaning. Nevertheless, if this is the case, there will be a systematic conflict that the new form must face. As in many other dialects, the Xin'an 新安 dialect employs total reduplication to denote diminutive sense ('smallness') or distributive sense ('each'). Supposing the new specialized meaning is likewise conveyed by $t\phi^h \eta an^{33} t\phi^h \eta an^{33}$, then, this form will be confused with total reduplication. That is, $t\phi^h \eta an^{33} t\phi^h \eta an^{33}$ would convey such meanings as 'small circle' or 'every circle', instead of the new specialized meaning that people have expected.

At this juncture, one may doubt this argument, asking "is it true that one identical reduplication pattern could not possibly express different meanings?" This is not a simple yes/no question. Actually in a language/dialect one identical reduplication pattern could be possibly used to convey different meanings, but the strong tendency is that different meanings are more ideally conveyed by varying duplication forms. For example, total reduplication in standard Mandarin has phonological alternates depending on different meanings: "vividness" for an iambic foot with a high level tone in the second syllable, "tentative and diminutive" for a trochaic foot, and "distributive" for a quasi-iambic foot. Thus we can infer now that the meaning to be expressed is different from that of total reduplication, and its reduplicated form should be different too. In short, $t\phi^h \eta an^{33} t\phi^h \eta an^{33}$ requires phonological modification and the motivation for doing so comes from the reduplication system.

In addition, that $t\phi^h \eta an^{33} t\phi^h \eta an^{33}$ needs further phonological adjustment has a more important motivation arising from the interaction between morphology and phonology. As mentioned above, OOP requests that one syllable denote one meaning and that one meaning be denoted by one syllable. Nevertheless, reduplication inevitably results in two syllables expressing one meaning, and this violates OOP. So, some modification must take place in order to satisfy this principle. Expressing a meaning is the only purpose of this reduplication process, and thus this meaning cannot be modified or changed. Given this condition, the modification can only be achieved through the phonological component. As we know, the reduplication mechanism in Chinese must produce at least one more syllable. As such, OOP seems to have to be unexpectedly

violated, but understandably it should simultaneously be obeyed to as high a degree as possible. How could the Xin'an 新安 people come out of this awkward situation? The only recourse is to modify these two syllables, making them sound as much as possible like one syllable. In terms of sonority peak of syllable, this auditory impression can be made possible as long as the two syllable peaks look (actually, sound) like one syllable peak.

We may first want to try the possibility of cutting the two peaks short. Having the two peaks lower could blur the boundary between the two syllables, and subsequently should leave such an auditory impression that the two syllables sound like one. This is a good plan, but it cannot be realized. To make the peaks lower, the core vowel *a* needs to be replaced by a glide, liquid or a nasal. However, in northern Chinese dialects there are normally no commonly-used rhyme-like consonants available for that position. Besides, the change in speculation will obviously violate the faithfulness constraint. This kind of modification has to be ruled out.

Another kind of modification worth thinking about is to shorten the distance between the two peaks. The concrete way to achieve this is to cut off the back slope of the first peak. By doing so, the two peaks no doubt will get closer, and it will advance further in achieving the impression of one syllable. Besides, this method conforms ideally to phonological regulations. In Chinese dialects, both CVC and CV syllables are common. As such, cutting the back slope of the first peak is no more than changing CVC to CV, and of course it is acceptable. Thus it is understandable that the modification of this kind is widespread in many dialects. For instance, in the Shunping 順平 dialect the first syllable of the fission reduplication form loses its coda, two moras being reduced to one mora; in the Jin 晉 dialect the first syllable without exception becomes a short checked syllable. As for the typical example $tɕ^h qan^{33}$ $tɕ^h qan^{33}$, what actually happens to it is that the glide *ɣ* is realized as the core vowel *y*, and the original core vowel *a* and the ending *n* are both deleted. The phonological modification is quite complicated, but its objective is very direct and clear. That is, to shorten the distance between the two peaks in order to make one-syllable impression.

There is also another way to achieve a monosyllable-like impression, in which the valley between the two peaks is raised. Let us look at two sketch maps first: 1) ; 2) . The reason that the latter looks more like one peak is because the valley has been raised. By the same token, if the sonority valley between the two syllables gets raised, there will be likewise a monosyllable-like impression attained. Working in this direction, we can see the ending of the first syllable and the initial of the second syllable both require modification. Since the former has been already deleted, then, we will naturally focus on the latter. As seen in (4) above, this position is occupied by the voiceless obstruent $tɕ^h$ -. This consonant is the lowest sound in terms of sonority, and so

it is very effective in making a sharp distinction of one syllable from the other. This effect, as discussed above, seems to contrast with the attempt to blur the boundary between the two syllables. Under such circumstances, it is inevitable that this consonant $tɕ^h$ - undergoes some kind of adjustment. In view of the purpose of raising the valley, the replacement sound for $tɕ^h$ - should be one with higher sonority. The sounds such as nasal, liquid, glide and vowel are all higher than obstruents in sonority, and hence all of them are candidates. But there is only one candidate that will win.

Vowels have the highest sonority, but the initial position does not allow them, and this candidate is naturally ruled out. The sonority level of glides is very high, second only to vowels, and moreover glides are frequently used to serve as initials as in jan^{55} , wan^{55} and $ɣan^{55}$ in Mandarin. So, a glide seems to be effective and practical in raising the sonority valley between the two syllables. Besides, as far as $tɕ^h ɣan^{33}$ is concerned, with the deletion of the initial $tɕ^h$ -, the glide $ɣ$ could naturally become the initial. Given these facts, $ɣ$ would be definitely chosen in order to raise the valley. However this is not attested since the glide $ɣ$ is not a typical consonant and it is not ideal to serve as onset/initial. We have many kinds of supporting evidence for this judgment and here is one. In standard Mandarin the syllable $wən^{35}$ is normally articulated as $vən^{35}$ though v - is not listed in the consonant inventory of standard Mandarin. The reason of this alternation is because the glide w - is not a typical consonant and is not ideal to be used as onset. Thus we can predict the glide $ɣ$ would not be chosen in this natural competition.

We may also think of the possibility of emptying the onset position. By doing so, the valley would be raised to the greatest extent and the monosyllable-like impression will be achieved. But this hypothesis is not attested either, because it contradicts the cross-linguistic generalization which states that CV/CVC syllables are preferable to V/VC syllables. In Shunping 順平 Mandarin, for instance, the syllables such as ai^{51} 愛, an^{213} 俺 and $ɤ^{51}$ 餓 are actually articulated as nai^{51} , $naŋ^{53}$ and $ɲɤ^{51}$ respectively. Syllables without onset are so unwelcome that they could not be chosen in natural competition.

Since vowels, glides and zero onsets are not suitable to serve as the initial of the second syllable, only nasals and liquids need to be considered. Unlike glides, both nasals and liquids are typical consonants and they are normally able to serve as onset. Besides, their sonority level is higher than that of obstruents and they will effectively raise the valley and blur the boundary of the two syllables. Which one, nasal or liquid, will be more suitable? The answer is certainly liquid since its sonority level is higher than that of nasals. Liquid is the winner, as shown in below.

(5) The second stage of fission reduplication

This scheme shows the phonological modification during the formation of fission reduplication. Since the liquid *l*- is the most sonorant consonant, accordingly it is chosen to replace *tʃʰ*- in order to raise the valley and blur the boundary of the two syllables. As seen in the diagram, the liquid *l*- successfully raises the sonority level from grade 1 to grade 3. Together with the shorter distance between the two syllables resulting from the elimination of the back slope of the first syllable, phonological modification of this kind would definitely result in a monosyllable-like impression in acoustic perception. To people in Xin'an 新安, the disyllabic form $t\check{c}^h y^{33} l\eta an^0$ is very suitable to denote such meanings as 'circle', 'hoop' or 'round trip (of a walk)'.

So far, we have taken the Xin'an 新安 dialect as an example, to explore the generative process of fission reduplication – it is morpho-phonological interaction that results in the occurrence of fission reduplication. Owing to iconicity, people choose reduplication to express a special meaning as opposed to a general meaning denoted by the monosyllabic base. On the other hand, because of OOP, the reduplicated form needs to be phonologically modified, in order that the disyllabic form sounds like one syllable. The direction of this modification is guided by cross-linguistic principles and dominated by Chinese language-specific principles. Consequently, the first syllable is shortened and the onset of the second syllable is consistently realized as a liquid. As such, a new reduplication pattern, fission reduplication, arises.

4. The similarity and discrepancy of fission reduplication across dialects

Fission reduplication is seen in both ancient Chinese and the modern dialects. It presents an inherent consistency in terms of phonological form and grammatical/semantic function. Nevertheless, we need to note that the variations on this pattern might be found in history and in different dialectal areas. In view of this, fission reduplication can be classified into three subcategories. The main criterion for this classification is the manner of modification of the rhymes of a fission reduplication word.

4.1 Faithful type of fission reduplication

In this type of fission reduplication, besides the common phonological modification seen in all examples of fission reduplication, extra modifications take place in the first rhyme. These modifications, as pointed out above, are motivated by the simplification tendency. Let us examine some examples found in fission reduplication in Fuzhou 福州.

(6) Fission reduplication in the Fuzhou 福州 dialect (Cf. Liang 1982)⁷

Base	fission reduplication
a. hiaŋ ²¹³ □	hia ¹¹ liaŋ ²¹³ 'about to fall'
b. pieu ⁵⁵ 森	pie ³¹ lieu ⁵⁵ 'spray'
c. pieu ²¹³ □	pie ¹¹ lieu ²¹³ 'emit, send up'
d. kouŋ ⁵⁵ 滑	ko ³¹ louŋ ⁵⁵ 'fall'
e. ts ^h uoŋ ⁵⁵ □	ts ^h uo ³¹ luoŋ ⁵⁵ 'give a start'
f. tɛu ³¹ 抖	tɛ ³¹ lɛu ³¹ 'droop, hang down'
g. k ^h uaŋ ⁵³ □	k ^h ua ³¹ luaŋ ⁵³ 'take a circuitous rout'
h. løyŋ ⁵⁵ 窿	lø ³¹ løyŋ ⁵⁵ 'hollow and ventilated'
i. høyŋ ¹³ 拂	hy ¹¹ (hø ¹¹) løyŋ ¹³ 'sob'
j. kei ²¹³ □	ki ¹¹ lei ²¹³ 'infant cry'
k. k ^h uŋ ³¹ □	k ^h u ³¹ luŋ ⁵³ 'whole bundle'

Let us take (6a) as an example. In line with the above analysis of the example in the Xin'an 新安 dialect, the modification happening in this example can be illustrated as follows:

hiaŋ ²¹³	(base)
hiaŋ ²¹³ hiaŋ ²¹³	(total reduplication—first stage of fission reduplication)
↓ hia ¹¹ liaŋ ²¹³	(fission reduplication)

Comparing -iaŋ²¹³ (rhyme of the base) with -ia¹¹ (first rhyme of the binom), we can see there are significant changes taking place, but the reduplicated form does not differ greatly from the original form. First of all, we see the main vowel changes from -a- to -a-. This change just obeys the regulated alternation in this dialect: if the main vowel in the base form is a lax one, then it will change to the corresponding tense one in the first

⁷ Liang (1982) did not always give the meaning of the base form. But she said (personal communication) the disyllabic form expresses a more vivid sense, as opposed to that of the monosyllabic form.

syllable of the fission reduplicated form. *-a-* and *-a-* form such a pair. As for the tone, we see it changes from 213 to 11, and this is also a regulated alternation during fission reduplication. In this dialect, the surface tone for the first syllable is dependent on the tone of the base syllable, which can be generalized as follows: 55, 53, 31 and 55 change to 31; 213, 353 and 13 change to 11. Thus we can see the change of 213 to 11 in (6a) is just a case of faithfulness. Making the most faithful preservation of the original value in the reduplicative form is the distinctive characteristic in the Fuzhou 福州 dialect.

Fission reduplication of this subtype is not common in modern dialects. However, fission reduplication in Old Chinese can be classified into this subcategory. In Old Chinese fission reduplication, in addition to fixed liquid **l-/*r-* in the second syllable, the most significant change happening in the first rhyme can be generalized as “identity avoidance at minimum”. This means the first rhyme must be modified but the modification must be minimized. Let us illustrate this point by examining two examples below.

(7) Modification in Old Chinese fission reduplication (Sun 1999, 2004)

		Li's OC	Pulleyblank's OC	Glossary
a. Base:	头	*dug	*dąq	‘head’
Fission redupl.:	髑髅	*duk lug	*dąk ^q ráq	‘skull’
b. Base:	茨	*dzjid	*dzəj	‘thatch’
Fission redupl.:	蒺藜	*dzit ljid	*dzək ^j rəj	‘puncture vine’

In (7a), the modification is found in the first syllable of the binom, in which the original **-g* is surfaced as **-k*, in accordance with Li's reconstruction. According to Pulleyblank's reconstruction, this change is represented as **-ŋ* to **-k^q*. No matter which reconstruction we follow, the basic distinction between the base ending and the reduplicant ending can be generalized as a minimum change. The same holds true for (7b), in which the change is **-d* to **-t* in Li's OC, and **-j* to **-k^j* in Pulleyblank's OC. The minimum change implies that the two sounds are still very close, and thus we can see the modification is indeed achieved in following the criterion of maintaining the base value as much as possible. In short, fission reduplication in both Old Chinese and the Fuzhou 福州 dialect undergoes the same kind of phonological modification, and accordingly fission reduplication in these two languages should be classified into the same subcategory.

4.2 Fixed rhyme type of fission reduplication

In some cases of fission reduplication, no matter what rhyme the base syllable has,

the reduplicant rhyme is always a form ending with a glottal stop -ʔ. This subtype of fission reduplication is mostly found in Jin 晉 dialects.

(8) Fission reduplication in the Pingyao 平遙 dialect (Cf. Hou 1989)

- a. pæ⁵³ 摆 'swing' → pʌʔ⁵⁴ læ⁵³ 'swing'
- b. pi⁵³ (tskʌʔ²³) 秕 (子) 'blighted grain' → pʌʔ⁵⁴ li⁵³ (tsʌʔ²³) 'blighted grain'
- c. tɕio¹³ 翘 'stick up' → kʌʔ⁵⁴ liɔ¹³ 'lift up (one's leg)'
- d. kəŋ⁵³ 埂 'low bank of earth between fields' → kʌʔ⁵⁴ ləŋ⁵³ 'slope between terraced fields'

(9) Fission reduplication in the Yimeng 伊盟 dialect (Cf. Li 1991)

- a. pən²³ 奔 'gallop' → pəʔ²¹ lən²³ 'gallop'
- b. pən⁵³ 笨 'fool' → pəʔ²¹ lən⁵³ 'fool'
- c. paŋ⁵³ 棒 'stick' → pəʔ²¹ laŋ⁵³ 'stick'
- d. p'au⁴⁴ 刨 'dig' → p'əʔ²¹ lau⁴⁴ 'dig'
- e. p'an⁴⁴ 盘 'dish' → p'əʔ²¹ lan⁴⁴ 'dish'
- f. taʔ²¹ 搭 'droop' → təʔ²¹ la²³ 'droop'

(10) Fission reduplication in the Shenmu 神木 dialect (Cf. Xing 2002)

- a. pɛ⁵³ 绊 'stumble' → pəʔ⁴ lɛ⁵³ 'stumble'
- b. pɛ²¹³ 摆 'swing' → pəʔ⁴ lɛ²¹ 'swing'
- c. təu⁴⁴ 头 'head' → təʔ² lo²⁴ 'head'
- d. tio⁵³ 掉 'fall' → tiəʔ⁴ lio⁵³ 'fall'
- e. xa⁴⁴ 匣 'small box' → xəʔ⁴ la⁴⁴ 'small box'

In contrast to the Fuzhou 福州 case, a prominent characteristic shared by the above examples (8-10) is that their first rhymes are always realized as -əʔ or -ʌʔ, regardless of the values of the base syllable. This fixed rhyme arises from the effect of OOP. As discussed above, OOP forces the two syllables to come close to each other in order to achieve the effect that the two syllables sound like one. In Chinese dialects, checked syllables are always described as relatively short and sharp. Hence checked syllables such as -əʔ or -ʌʔ, used in the first rhyme, will no doubt bring the two syllables closer, leaving a monosyllable-like impression in pronunciation. On the other hand, all checked syllables in Jin 晉 dialects end with -ʔ, and consequently, it is very natural to choose -əʔ or -ʌʔ as the first rhyme.

Jin 晉 dialects present a unique characteristic regarding the modification of the first rhyme during fission reduplication, which is not seen in other dialects. However, we can find an analogue for it in history. As mentioned above, fission reduplication is also attested in Middle Chinese. Looking at the first syllables of those particular disyllabic forms in Hong Mai's 洪邁 *Rongzhai suibi* [容齋隨筆], we find they are

mostly checked syllables.

(11) Fission reduplication forms in Song (960-1279)

a. gǔlù 骨露 LMC ⁸ kut luə'	b. qūluán 屈孌 LMC k ^h yt lyan
c. tūluán 突栾 LMC t ^h ut lawn	d. jíling 即零 LMC tsiak liaŋ
e. kūluò 矽落 LMC k ^h ut lak	f. bólan 勃蘭 LMC p ^h iut lan
g. bùláng 步廊 LMC p ^h ua' lan	h. tūluò 突落 LMC t ^h ut lak

For each item, the modern pronunciation comes first, followed by the Chinese characters and the LMC pronunciation. Now let us focus on the first syllables, which are all checked syllables. We first need to assign them appropriate reconstructed forms. Since these forms are found to be used in the central areas of Song, Kaifeng 開封 and Luoyang 洛陽, it is suitable to apply the Kaifeng 開封 and Luoyang's 洛陽 phonological systems to these forms.

According to Zhou (1943), Shao Yong's 邵雍 (1011-1077) *Huangji jingshi shengyin changhetu* [皇極經世聲音唱和圖] represents the standard phonological system of Song and thus we should work on the basis of this to get the relevant phonological information. In early rhyme tables such as *Yunjing* [韻鏡], the rhymes with a nasal ending and the rhymes with an obstruent stop ending are arranged in one table. This is understandable because nasal endings *-m*, *-n* and *-ŋ* correspond to *-p*, *-t*, and *-k*. However, in Shao Yong's tables, the rhymes with *-m* and *-p* are still arranged in the same table, but the rhymes originally ending with *-t* or *-k* are nevertheless moved into the tables where rhymes with a glide ending or a zero ending are mostly located. Based on such special arrangements of rhymes, Zhou came to such a conclusion that the endings *-t* and *-k* no longer existed in Kaifeng 開封 and Luoyang's 洛陽 phonological systems. However, since *-p* still existed at that time, we can imagine *-t* and *-k* would not be lost completely. During the development of checked syllables into open syllables over Chinese phonological history, *-p*, *-t*, and *-k* were not lost all at once, and instead, they underwent a stage of neutralization into *-ʔ*, as we can see now in Taiyuan 太原, Yangzhou 揚州 and Suzhou 蘇州. Given these facts, the first syllables in those Northern Song fission reduplicated forms then should be reconstructed as follows.

⁸ LMC is short for Later Middle Chinese. See Pulleyblank (1991).

(12) The first syllables of fission reduplication forms in Song

the 1 st ɔ	LMC	Standard language of North Song
gǔ 骨	Kut	ku?
qū 屈	k ^h yt	k ^h y?
tū 突	tʰut	tʰu?
jí 即	tsiak	tsi?
bó 勃	pʰut	pʰo?
kū 屹	k ^h ut	k ^h u?
bù 步	pʰua'	pʰu'

Except for the last one, all other characters are checked syllables with the ending -ʔ. This is to say that the fission reduplication forms in Northern Song are all the same as those in Jin 晉 dialects.

4.3 Trochaic type of fission reduplication

In comparison with the faithful type and fixed rhyme type, the outstanding features of the trochaic type of fission reduplication can be characterized in two aspects. First, the first syllable consistently presents a single vowel as the rhyme, regardless of whether there is a coda or not in the base syllable. Second, the second syllable always has a neutral tone. Fission reduplication of this type is widely distributing in northern dialects. Look at the following examples.

(13) Fission reduplication in the Xin'an 新安 dialect

Base	Fission reduplication form
a. kaw ³³ 膏 'grease'	kə ³³ law ^o 'scabies'
b. kəw ⁴¹² 够 'enough'	kə ⁵³ ləw ^o 'kind of big bowl'
c. kəŋ ⁵³ 埂 'a low bank of earth between fields'	kə ⁵³ liŋ ^o /lin ^o 'slop between terraced fields'
d. tsa ⁴¹² 雜 'miscellaneous'	kə ⁵³ ljəw ^o 'small ridge on the surface of things'
e. tɕjaw ⁵³ 攪 'stir'	tsa ⁵³ la ^o 'tripes and chitterlings'
f. k ^h uŋ ⁵³ 孔 'hole'	kə ³³ law ^o 'stir'
g. k ^h ə ³³ 窠 'nest, burrow'	k ^h u ⁵³ luŋ ^o 'hole, cavity'
	k ^h ə ³³ ləw ^o 'foundation work of a house done with a uncompleted walls'

Unlike those in Fuzhou 福州 and Jin 晉, fission reduplication forms in Xin'an 新安 undergo significant modification of rhymes, realizing ə, a or u for the first rhyme

and neutral tone for the second. Thus the disyllabic form becomes trochaic.

Focusing on the tone, we find that some fission reduplicated forms present a polarity alternation, that is, the first syllable has a rising tone and the second a falling tone. Look at examples in (14).

(14) Fission reduplication in the Liquan 醴泉 dialect

Base	Fission reduplication form
a. xwæ ⁴⁴ 喚 ‘call’	xwo ⁴⁴ lwæ ⁰ ‘cry, summon’
b. tsa ²¹ 渣 ‘dregs’	tsɿ ²¹ la ⁰ ‘fat dregs’
c. tɕ ^h qæ ²¹ 圈 ‘circle’	(ɲjow ²⁴ ‘cow’ meaning ‘big’ here) tɕ ^h y ²¹ lqæ ⁰ ‘circle-shape steamed bun for the celebration for a baby’s 100 th day’
d. p ^h a ²⁴ 耙 ‘rake up’	p ^h u ²⁴ la ⁰ ‘rake up recklessly’
e. kow ²¹ 鉤 ‘to hook’	kɿ ²⁴ ləw ⁵³ ‘pull something down by using hook’
f. k ^h ow ²¹ 口 ‘mouth’	k ^h ɿ ²⁴ ləw ⁵³ ‘pit’
g. woŋ ⁴⁴ 瓮 ‘big jar’	wu ²⁴ luŋ ⁵³ ‘bind a broken jar with rope’
h. p ^h æ ²⁴ 盘 ‘plate’	p ^h u ²⁴ lwæ ⁵³ ‘round bamboo container for food’

The first four examples are the same as those in Shunping 順平 (see (1) above) and Xin’an 新安 (see (13) above), presenting a trochaic disyllabic form. The latter four examples nevertheless present a polarity tonal pattern, regardless of the base tone value. For example, in (14e,f), both reduplication forms present a rising tone 24 for the first syllable and a falling tone 53 for the second, and these tone values have nothing to do with the tone of the base forms. The same holds true in (14g, h), where the polarity alternation is attested though their base forms have a level tone and rising tone respectively. Polarity alternation is different from trochaic alternation. But, because both kinds of tonal alternations can be regarded as fixed and they co-exist in the same dialect, we may deal with them jointly.

In section 3 above, I argued that the formation of fission reduplication is actually determined by OOP. Now I will show that the tonal alternations seen in (13) and (14) are likewise determined by OOP. Simply speaking, OOP triggers such tonal modifications so as to make a disyllabic form sound like one syllable. This argument can be supported by the following facts. In Mandarin the stress pattern of a disyllabic word is usually quasi-iambic.⁹ But, if a disyllabic word takes the suffix, *zǐ* 子, *ér* 兒 or *tóu* 頭, as the second component, or if a disyllabic word is a gestalt word,¹⁰ then, its

⁹ Cf. Lin and Wang (1992).

¹⁰ I understand “gestalt word” as a word that is not easy to be decomposed in meaning and that is usually memorized as a whole by the language community. Packard (2000) wrote a chapter

stress pattern will be trochaic. Now let us consider the semantic component. As we know, a suffix always denotes something grammatical, and thus, what the disyllabic word with a suffix denotes can be regarded as just one semantic meaning. As for a gestalt word, since it is hard to be semantically decomposed, what it denotes thus can also be regarded as one meaning. The facts discovered here are significant. On the one hand, each of such disyllabic words denotes an undecomposed (or hardly-decomposed) meaning, and on the other hand, these words fall in the trochaic stress pattern. In view of the effect of OOP, then, we can see it is OOP that forces the disyllabic words to be trochaic -- when a disyllabic form is unavoidably used as a vehicle for one meaning, this disyllabic form tends to become trochaic in order to show its obedience to OOP. By the same token, for the fission reduplication forms in Shunping 順平, Xin'an 新安 and Liquan 醴泉 (see (1, 13 and 14) above), why a trochee arises after a series of modifications is just because there is only one undecomposed meaning that needs to be signified by this disyllabic form.

In (14e-h), regardless of the tonal value of the base syllable, these disyllabic words present a polarity tonal pattern. Why this fixed tonal pattern could be applied in fission reduplication is explainable. It first needs to be noted that these two adjacent tones tend to be polar in terms of tone pitch as long as unspecified. Chinese is a tonal language and its syllables possess one tone. But in the case of fission reduplication the two syllables carry only one meaning, and there is no way to assign a meaningful tone to each syllable of the disyllabic form. Under such circumstances, these two adjacent tones are more easily subject to such a common tone sandhi as polarity. Thus we can see the polarity tone sandhi is the same as the occurrence of the trochaic pattern, and both kinds of modifications have shown the further development of fission reduplication in the northern dialects.

4.4 Summary

In the above discussion in this section, I have divided fission reduplication in modern Chinese dialects into three subtypes, on the basis of different modifications of the rhyme. In the case of Fuzhou 福州, the rhyme of the first syllable is modified in some way as to fully reflect the base values. This is the same as what we can find in Old Chinese. Thus it provides a piece of new evidence for the long-held view that the Fuzhou 福州 dialect diverged from mainstream Chinese a long time ago. In the Jin 晉 dialect, the first syllable presents a fixed checked syllable, regardless of the base value. This can be traced back to the standard Chinese in Song. The fact that the Jin 晉 dialect

entitled "Gestalt Chinese Words", exclusively discussing this subject.

and Song Chinese operate fission reduplication in the same manner makes us believe it is reasonable for some scholars, as they have, to treat Jin 晉 as an independent dialect, parallel to other Chinese dialects such as Mandarin, Yue 粵 and Min 閩. The significant characteristic attested in the northern dialects is the occurrence of the trochaic pattern and the polarity tone sandhi. This represents a new development of fission reduplication.

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現代漢語方言中的裂變重疊

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裂變重疊普遍存在於現代漢語方言。基於田野調查所得第一手材料，我們看到，這一形態構詞過程在形式上表現為一個單音節基式裂變為兩個音節，在意義上則表現為“特殊義”的產生。裂變重疊在不同方言中有不同的表現，據此可進一步細分為三個次類，即忠誠型、固定韻母型、揚抑型。客觀描寫之外，本文還在特定語言規則以及普遍語法規則的基礎之上初步建構了一個音義互動的理論框架以說明裂變重疊的生成過程。

關鍵詞：重疊，音義互動，音節劃分，方言