

# Syntax-based phonological asymmetries: The case of adjective reduplication in Mandarin Chinese



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## Abstract

In Prosodic Morphology, reduplication frequently targets phonological constituents such as syllables, feet, or prosodic words. In Mandarin Chinese, however, adjective reduplication targets syntactic units whose size and position depend on the morphosyntactic structure of the base. Specifically, subordinate compounds of form AB are reduplicated as ABAB, whereas coordinate compounds of the same form are reduplicated as AABB. Moreover, two reduplicated forms behave differently in terms of phonological patterning such as more neutralization in AABB and ABAB being transparent. In this article, I show that the phonological asymmetry between two reduplicated forms is a consequence of the distinct morphosyntax of the base and its mapping onto different prosodic structures at the interface. While reduplication making reference to syntax has been reported in the literature (e.g. Ghomeshi et al., 2004; Kirchner, 2010), the Mandarin data is particularly interesting as syntactic reduplication further leads to interesting phonological asymmetries, calling for an elaborated theory of the interface between morphosyntax and phonology. I discuss implications of the current data for previous models of the syntax-phonology interface.

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**Keywords:** Mandarin; Reduplication; Coordinate compounds; Distributed Morphology; Syntax-phonology interface; Prosodic constraints

## 1. Introduction

In Prosodic Morphology (McCarthy and Prince, 1994), reduplication often targets morphological units such as stems or lexical words, whose surface form is further shaped by independent phonological constraints that prefer certain phonological units such as feet, syllables or prosodic words. This particular relation between morphology and phonology ensures that a reduplicant is often phonologically less marked than its base. However, reduplication that seems distinct in nature has also been reported in the literature. That is, reduplication targets syntactic units such as  $X^0$  or XP rather than simple morphological units. For example, in English Contrastive Reduplication (CR), reduplication may target a unit as small as  $X^0$  (e.g. *GLOVE-gloves*) or a unit as large as  $XP^{\text{min}}$  consisting of the head and its complement (e.g. *TALK-ABOUT-IT-talk-about-it*) to draw a prototypical reading of the base (Ghomeshi et al., 2004). Similarly, in Tamil Echo reduplication, reduplication (specified with '#ki') may target a lexical word (e.g. *puli KILL<sub>ECHO</sub> tiger-ECHO* 'tigers and other beasts') or an entire complementizer phrase (e.g. [*kumaaru-kku kuṭu-tt-eeen-ṇṇu*]-[*KIMAARU-KKU KUṬU-TT-EEN-NṆU*]<sub>ECHO</sub> 'that you gave it to Kumar, or some such nonsense') (Keane, 2001; Kirchner, 2010). In line with the literature,

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this article presents reduplication of disyllabic adjectives in Mandarin Chinese that is syntactic in nature. Furthermore, Mandarin presents an interesting test case for the syntax-phonology mapping as reduplicated forms with distinct syntactic structure show clear phonological asymmetries.

To begin with, reduplication in Mandarin adjectives is syntactic as it is sensitive to the morphosyntactic structure of the base. Specifically, subordinate compounds of form AB (where morpheme A modifies the head morpheme B) are reduplicated as ABAB (1a), whereas coordinate compounds of the same form (where A and B both are heads of the compounds) are reduplicated as AABB (1b). Both reduplicated forms are used to add a higher degree of liveliness or intensity to the base form (Chao, 1968; Li and Thompson, 1981; Tang, 1988). All transcriptions are given in the Chinese Romanization system ‘Hanyu Pinyin’.

(1) Some examples of Mandarin adjective compounds and their reduplicated forms

a. Subordinate compounds and their ABAB reduplicated forms

Base	Gloss	Translation	Reduplicated form
xue-bai	snow-white	‘white’	xue.bai.xue.bai
tong-hong	entirely-red	‘red’	tong.hong.tong.hong
si-ying	die-hard	‘hard’	si.ying.si.ying

b. Coordinate compounds and their AABB reduplicated forms

qin-mi	close-intimate	‘close’	qin.qin.mi.mi
gao-xing	high-prosperous	‘cheerful’	gao.gao.xing.xing
xin-ku	laborious-bitter	‘hard’	xin.xin.ku.ku

More interestingly, two reduplicated forms show a clear asymmetry with respect to phonological processes; ABABs are fully faithful to their underlying specification, but AABBs are subject to various phonological processes. Several variable rules apply in AABB compounds: (i) tone neutralization in the second syllable (e.g. qin<sup>55</sup>qin<sup>0</sup>mi<sup>51</sup>mi<sup>51</sup> ‘intimate [+int]’),<sup>1</sup> (ii) optional deletion of the second syllable (e.g. da<sup>51</sup>(da<sup>0</sup>)fang<sup>55</sup>fang<sup>55</sup> ‘generous [+int]’), (iii) infixation of a place holder *bu* into the second syllable (e.g. suan<sup>55</sup>bu<sup>0</sup>liu<sup>55</sup>liu<sup>55</sup> ‘sour [+int]’), and (iv) high tone on BBs (e.g. re<sup>51</sup>re<sup>0</sup>huo<sup>55</sup>huo<sup>55</sup> ‘pally [+int]’ from /re<sup>51</sup>huo<sup>0</sup>/). None of these rules apply in ABAB compounds.

The general architecture of grammar that the present study advocates is that grammar is largely modular where each module is governed by independently motivated principles. Due to the necessary mapping at the interface, however, the outputs of an earlier derivation are often the key to the understanding of the output patterns of later derivations. In this regard, the above Mandarin data contribute an interesting case study to the literature that attempts to search for the adequate theories and assumptions for the patterns involving both morphosyntactic and phonological behaviors. Specifically, the main claim of this article is that the phonological asymmetry between the two reduplicated forms is a consequence of the distinct syntactic structure of the base and their mapping at the interface. In particular, I will provide evidence that subordinate compounds are reduplicated as a whole, while a unit smaller than a word is reduplicated in coordinate compounds. The seeming disruption of the morpheme order in AABB where the base form AB are no longer entirely adjacent to each other is analyzed as a case of morphosyntactic lowering (Embick and Noyer, 2001; Idsardi and Raimy, 2013) and subsequent morpheme copying (Ackema and Neeleman, 2004, 2005; Walker and Feng, 2004) motivated by the double headedness of the base. With a reduplicative affix adjoining above vs. below the categorizing head, respectively, two reduplicated forms will be mapped onto prosodic units of different sizes at the interface: reduplication of subordinate compounds will include two prosodic words (i.e. [AB][AB]) while reduplication of coordinate compounds will include a single prosodic word (i.e. [AABB]). With a longer prosodic word, AABBs are more likely to be subject to phonological reduction than ABABs.

The current work joins the existing literature concerning the influence of the syntactic structure on phonological patterning. In the context of compounding, for example, Ito and Mester (2007) argue that Rendaku, voicing of a voiceless consonant in non-initial position of a compound, in Japanese is sensitive to the syntactic structure of the input. An interesting asymmetry is that Rendaku applies to a left-branching structure (e.g. [[hana zono] basi] ‘flower-garden bridge’), while it is blocked for a right-branching structure (e.g. [hatu [kao awase]] ‘first face-meeting’). Ito and Mester argue that the asymmetry arises from the distinct prosodic structure of the two forms: the left-branching structure forms a single prosodic

<sup>1</sup> Following the convention in Chinese linguistics (after Chao, 1968), four lexical tones in Mandarin Chinese are represented as X<sup>55</sup>(high level), X<sup>35</sup>(rising), X<sup>21(4)</sup>(low dipping) and X<sup>51</sup>(falling), and neutral tone as X<sup>0</sup>. Phonetically, neutral tone has no inherent pitch target but is realized by pitch interpolation from tone of the preceding syllable.

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