3 Minimal word and its function in Mandarin Chinese

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The notion of Minimal Word (MinWd) has always been a fundamental concept in the Prosodic-Morphological systems developed since McCarthy and Prince (1990). It is a prosodically circumscribed domain which may be selected as the locus of morphological transformation in lieu of the whole domain (McCarthy and Prince 1990, 1993, 1998). Theoretically, the notion of MinWd is derived from the interaction of both Prosodic Hierarchy and Foot Binarity, as stated in the following (taken from McCarthy and Prince 1998: 284):

1. Prosodic hierarchy
   \[
   \begin{array}{ccc}
   \text{Prosodic Word} & \text{PrWd} \\
   \text{Foot} & Ft \\
   \text{Syllable} & \sigma \\
   \text{Mora} & \mu \\
   \end{array}
   \]

2. Foot binarity: Feet are binary under syllabic or moraic analysis.

The Prosodic Hierarchy impinges on every prosodic word to contain at least one foot, while the Foot Binarity demands that every foot be bimoraic or disyllabic. As a result, a prosodic word must contain at least two moras or syllables according to the transitivity of the Prosodic Hierarchy. The Minimal Word is therefore a single PrWd in the system. As we will see below, the Minimal Word is of singular importance in characterizing a wide range of Prosodic-Morphological phenomena not only in languages known in previous studies, but also, as I would like to argue in this chapter, in Mandarin Chinese.
Of course, we are fully aware that in Chinese morphology, there are complexities which may not be accounted for only by the MinWd hypothesis. However, what I am going to demonstrate is this: there are phenomena that can only be explained in terms of a Minimal Word analysis. This is the very purpose of the present study.

This chapter is organized as follows. The section titled “Minimal word as a condition for VO compound” consists of a study on the verb-object structure and shows that among all VO forms in the language, only the ones that meet the minimal word requirement exhibit word properties while longer forms are all on a par with phrases. The section, “Minimal word as a condition for category changing,” shows that a process of category changing from a [Aux V] verbal expression to a [Aux-V] object compound is conditioned strictly on whether or not the [Aux V] is a minimal word. “Minimal word as a condition for morphosyntactic operation” demonstrates that there is a clear distinction between MinWd and non-MinWd [A+N] forms differentiated syntactically as well. The last section is a summary of this study.

**Minimal word as a condition for VO compound**

In Chinese traditional linguistics, it has long been a problem to distinguish VO compounds from VO phrases. For example:

3. a. 关心
   guān-xīn
   concern heart
   “concern”

   a‘. 我关心他。
   Wǒ guān-xīn tā
   I concern him
   “I am concerned about him.”

   b. 我很担心他。
   Wǒ hěn dān-xīn tā
   I very worry him
   “I am very much worried about him.”

   b‘. 他担心我。
   Tā dān-xīn wǒ
   he carry ASP three years heart
   “He has been worried for three years.”

   c. 跑步
   pǎo-bù
   run feet,
   “jog”

   c‘. 他跑了三次步。
   Tā pǎo le sān cì bù
   he run ASP three time feet
   “He went jogging three times.”

   d. 睡觉
   shuì-jǐo
   sleep-wake
   “sleep”

   d‘. 他睡了一天的觉。
   Tā shuì le yī tiān de jiào
   he sleep ASP one day POSS wake
   “He slept for a day.”

As we can see from the above examples, a VO form can sometimes be separated as a phrase and sometimes be used as a word. This situation has motivated Chao (1968) to characterize the alternative forms in terms of *ionization*. Since then, great efforts have been devoted to the study of a variety of conditions by which compounds and phrases can be distinguished (see Lu 1964, Huang 1984, Dai 1992, Zhang 1992, Duannu 1998, and Packard 2000). However, even though various proposals have been made and each of them may work in certain areas for certain cases, there is no overall generalization and constraint on what is a compound and what must be a phrase. This difficulty has made linguists wonder if there is indeed a clear-cut distinction at all. Hu (1999), for example, recently claimed that since there is no overall satisfactory conclusion after years of theoretical investigation, linguists should consult with native speakers about what a word is. This suggestion was carried out by Wang (1998) in a study of a total of 647 questionnaires. The informants were asked to make judgments about the number of words in a ten-sentence sample in which twenty-five VO forms are distributively used. The results, as we can see from Table 3.1, are somewhat surprising (taken from Wang 1998, only 5 forms are given here).

| Table 3.1 Judgments on wordhood for VO forms |
|-----------------|-------------------|-------------|
| VO forms          | word (%) | phrase (%) |
| shuì jiào “have a sleep, sleep” | 95.97    | 4.03       |
| xiăo zuò “take a bath, bathe”     | 92.52    | 7.48       |
| pǎo bù “run feet, jog”             | 99.34    | 0.66       |
| niăn shù “read books, study”       | 96.84    | 3.16       |
| dān xīn “carry heart, worry”       | 97.01    | 2.99       |

As seen in Table 3.1, the informants’ judgments are far different from linguists’ because according to linguistic analysis, the first four forms should all be analyzed as phrases. However, the native speakers’ judgments converge to form one conclusion: disyllabic VO forms (or more specifically, VO idioms) are overwhelmingly considered words. For traditional linguists these results create more puzzles than solutions because what are analyzed as phrases by linguists are treated as words by native speakers. On one hand, linguists cannot rely on a layman’s conception of what a word is. On the other hand, linguists cannot ignore
native speakers’ intuition about what a word is, especially when there is a strong agreement among speakers on the issue. It seems that the notion of “word” as used by non-linguists may not be the same as the one used by linguists. At present, we are left with two fundamental questions that need to be considered immediately. First, why are native speakers more likely to consider disyllabic forms to be words, even if some of them are linguistically tested as phrases? Second, are there any clear-cut distinctions at all between what must be considered compounds and what must be considered phrases?

Given the minimal word theorem and the fundamental hypothesis \( P \gg M \) (prosody determines morphology) in Prosodic Morphology, I would argue that the study of Chinese morphology will make a great deal of progress once the PrWd is taken into account. As we will see later, the prosodic analysis proposed here not only gives us an entirely new insight into Chinese morphology, but also enables us to determine a prosodic-morphological domain in which every form is legitimate to be or become a compound within that domain and every form beyond (bigger than) the domain is a phrase, strictly within VO and similarly within other structures as well. In other words, there indeed exists a clear boundary demarcating what can be a compound and what must be a phrase or at least have phrasal properties, defined by a prosodic qualification of being a minimal word—a new discovery which could explain quite a wide range of phenomena in Chinese morphology and syntax.

To see how prosody works in Chinese VO compounds, let us assume, first, that within a structure of two sister nodes labeled as in (4a), if every syllable of the two sister nodes (V and N) is footed (by Parse-all-Syllable requirement) and the left edge of every foot aligns with the left edge of some PrWd (All-Foot-Left requirement), then the two sister nodes will satisfy the requirements of being a MinWd, provided that every syllable in Chinese is a morpheme. This is shown in (4b):

4. a.  
\[ V \quad O \]

b.  
\[ \text{PrWd} \]

Second, it is well-known that the VO compounds in Chinese are all formed with a left-headed structure, exactly like VO phrases. That is to say, the internal argument of a verb must be located on the right side of the V in both phrases and compounds. Given this, if prosody indeed determines morphology in Chinese, we would expect the interaction to give rise to a Templatic Constraint for compounding. That is,

5. Templatic constraint on VO compounds

\[ \text{VO-Compd} = \text{PrWd} \]

"The VO-compound is a prosodic word.”

This is expected because a prosodically circumscribed domain (MinWd) can be taken as the locus of morphological transformation required by \( P \gg M \), and because compounding is the most productive morphological process in the language. As a result, if PrWd is the most harmonic prosodic unit in the language and if it affects morphology at all, then compounding will be the very target inevitably impinged upon by the PrWd engaged in prosodic-morphological operations. As we will see below, this is indeed the case.

First, we have discovered that even if not all VO forms can take an object, the ones that can are all disyllabic (i.e., PrWd). For example:

6. 负责  

\[ \text{fù-zé} \]

carry-responsibility  

"be responsible for, be in charge of”

\[ \text{他负责保卫工作。} \]

\[ \text{Tā fù-zé bǎowèi gǎngzuò} \]

he carry-responsibility security affairs

"He is in charge of security affairs.”

关心  

\[ \text{guān-xīn} \]

concern heart  

"concern, care for”

\[ \text{他不关心 / 别人。} \]

\[ \text{Tā bù guān-xīn biérén} \]

He not concern-heart others

"He does not care about others.”

担心  

\[ \text{dān-xīn} \]

carry heart  

"worry”

\[ \text{他担心情况会有变化。} \]

\[ \text{Tā dān-xīn qíngkuàng hào yǒu biànhuà.} \]

he carry-heart situation will have change

"He worries that the situation will change.”

There is no doubt that when it takes an object, the VO must be considered a compound, because the internal verb+object structure is syntactically opaque as far as the phrase-structure condition is concerned. Given this, all of the above VO forms are doubtlessly compounds. We are aware of the fact that not all disyllabic VO-compounds can take an “outer” object. However, what is important to note here is a categorical behavior of the trisyllabic (or polysyllabic) forms. No polysyllabic VO forms can take an “outer” object. For instance,
The contrast between (6) and (7) shows that only disyllabic VO forms can have an object, while all trisyllabic forms cannot. A question rises immediately: Why can trisyllabic forms not take an object in the way that disyllabic forms can? Whatever the reason, there is no question that there exists a categorical distinction between disyllabic VO forms on the one hand, and trisyllabic VO forms on the other.

Of course, one may wonder if the trisyllabic VO forms are intransitive verbs because, if they are, they do not take an object. However, even if this is so, the same question still remains: Why is it that only disyllabic but not trisyllabic forms can be transitive? It appears that the same conclusion will still pertain. There must be a distinction between disyllabic and trisyllabic VO forms in the language. The question, then, is: Why is there a distinction and how does it come about? Obviously, an explanation is called for.

Furthermore, examples given below show that the trisyllabic VO forms cannot simply be considered intransitive verbs because they cannot take aspect markers like VO verbs do.

8. a. 他负责保卫工作。
   Tā fù-zé -guò bāowèi gǒngzuò
   he carry-responsibility ASP security affair
   “He has been in charge of security affairs.”

b. 他负责保卫工作负责任过。
   Tā fù-bāowèi gǒngzuò fù zé-rèn -guò
   he to security affair carry responsibility ASP
   “He has been in charge of security affairs.”

b'. 他对保卫工作负责任过。
   Tā duì bāowèi gǒngzuò fù-guò zé-rèn
   he to security affair carry ASP responsibility
   “He has been in charge of security affairs.”

c. 他担心你的健康。
   Tā dān-xīn -zhe ni de jiànkāng
   he carry-heart ASP you POSS health
   “He is worrying about your health.”

d. 他开玩笑地说……
   Tā kāi wèixiào -zhe shuō ...
   He make joke ASP say ...
   “He is making jokes while talking”

d'. 他开玩笑说……
   Tā kāi -zhe wèixiào shuō...
   He make joke ASP say
   “He is making jokes while talking.”

As a general rule, a VO compound, like all other verbs in the language, can naturally co-occur with an aspect marker. Thus, in (8a) fù-zé can occur with an experience aspect marker -guò and in (8c) dān-xīn is with a progressive aspect marker -zhe. What is remarkable in the above examples is that all the ones that can take an aspect marker are disyllabic while all of the forms that cannot are trisyllabic. It is clear that the ones that can take aspect markers must be compound verbs and the ones that cannot must not be compounds because there is no reason for a compound verb not to be able to co-occur with an aspect marker. Given this, we see that all compounds are disyllabic and all trisyllabic forms are not compounds. Put differently, all trisyllabic VO forms, unlike the disyllabic ones, cannot function as a single (or a zero-level) verb, hence cannot be considered a compound. Thus it can be concluded that trisyllabic VO forms must all belong to the category of phrases.

The contrast between (8c) and (8d) therefore suggests a prosodic categorization in the Chinese morphological system. That is, only disyllabic VO forms can be compounds while all trisyllabic VO forms lack the ability to be compounds. As seen above, the disyllabic in the definition of the prosodic word, thus, can be clearly seen that, for all VO forms, only the ones that meet minimal word requirements are qualified to be compounds (through regular word formation or lexicalization), while those whose size is bigger than a PrWd are not qualified to be compounds.

Finally, separability can also be used to manifest the distinction between disyllabic and trisyllabic VO forms. That is, only disyllabic forms cannot be separated, while all other polysyllabic forms are separable. For example ("de" is a possessive marker in Chinese):
As shown in the separability test above, we see, again, that there is a clear distinction between what is revealed in the disyllabic forms and what is lacking in the trisyllabic VO forms.

The evidence above leaves no doubt that the minimal word (PrWd) is indeed very active in the language, otherwise there would be no explanation for why disyllabic VO forms are systematically different from disyllabic ones. That is to say, within the VO structure, if the verb and its object are formed by exactly two syllables, then the VO form will construct a minimal prosodic unit. Since the minimal prosodic unit is the most harmonic PrWd in the language, by P >> M, all compounds that are formed by verb+object must first be a PrWd. This is captured by the Templatic Constraint given in (5).

Under the above analysis, we now begin to understand why disyllabic VO forms such as niǎn-shū “read books,” shuì-jīào “have a sleep, sleep,” etc., in Table 3.1 are treated as “words” by native speakers. It is because they represent the most harmonic prosodic category of PrWd, even though they are not lexicalized or idiomatized. On the other hand, longer VO forms such as kāi wénxiào "joke," jī fù zèrén “be in charge of,” etc., have never been perceived as words by native speakers because they do not meet the definition of a PrWd, hence they can never be lexicalized as compounds regardless of how highly they are idiomatized. This suggests that the native speaker’s intuition about “words” in Wang’s study is in fact a prosodic notion of PrWd, which is different from the syntactic notion of word used by traditional linguists.

This calls for a further explanation about disyllabic VO idioms. By syntax, the disyllabic idioms are not compounds; by prosody, however, they belong to the same category of foot, hence they satisfy the requirement of being a PrWd, even if they are not (yet) lexicalized as a compound in the lexicon. The native speaker’s word-judgments about the disyllabic idioms clearly suggest that in Chinese, even phrases are distinguished prosodically. That is to say, there are apparently two types of phrases: one consists of disyllabic idiomatized phrases which meet the MinWd requirements perfectly and have the potential to become compounds, and so can be interpreted by native speakers as a single unit (i.e., a “word” in an undefined usage, but a PrWd in a strict sense). The second one consists of freely constructed polysyllabic phrases that are beyond the Templatic Constraint, and hence can never become compounds in the language. This indicates further that the native speaker’s intuition about the disyllabic forms is not based on an innate grammar of syntax (which sometimes can best be detected by linguists), but primarily on an innate grammar of prosody.

In fact, if pāo “pig,” niǎn “year,” niǎn shū “read books, study,” etc., in Table 3.1 are indeed phrases, the only way to explain the native speakers’ word-intuition about these phrases is to admit that the function of minimal word is also active in syntax (at the PF level or before Spell-Out as suggested in Zubizarreta 1998). Nevertheless, the fact shows clearly that PrWd also circumscribes phrases in syntax. Given this, we may suggest that the notion of PrWd defined in terms of prosody could function at different levels of grammar, that is, it can apply to both morphology and syntax, though the ways it works may be different. In morphology, every VO compound must be PrWd. In syntax, every VO phrase that meets the PrWd requirements has the potential to become a compound depending on its semantics and pragmatic usage in the language, but importantly, those whose shapes are beyond the control of minimality constraint will never be compounds. This gives rise to the distinction between disyllabic idioms that are treated as words and trisyllabic idioms that are not considered words by native speakers. Thus, the linguistic intuition of PrWd by Chinese speakers provides strong evidence that the minimal word constraint applies not only to morphology but also to syntax.

### Minimal word as a condition for category changing

The minimal word effect can also be observed in auxiliary+verb compounds in Chinese. The auxiliary ke “can” can be used to form a compound with a verb, meaning “V-able,” for example:

10. 可笑 kě-xiào “can-laugh, laughable”
    可怜 kě-lián “can-sympathize, pitiable”
    可靠 kě-kào “can-trust, trust-able, reliable”
    可怕 kě-pà “can-terrify, terrible”
    可耻 kě-chǐ “can-shame, shame-able, shameful”
    可行 kě-xíng “can-do, doable”
    可爱 kě-ài “can-love, lovable, lovely” (ALSO “cute”)?
    可恨 kě-hèn “can-hate, detestable, hateful”
    可疑 kě-yí “can-suspect, suspect-able”

In Chinese, the ordinary ke-V compounds all consist of two syllables. Of course, there are Aux+VV trisyllabic forms used in the language, too. For example:
11. 11. 可造就的人
kē-zuòjiǔ DE rèn
"a person who can be trained, a trainable person"

可加工的材料
kē-jīgōng DE cáilìào
"can-process’s material” “material that can be processed, process-able material”

可阅读的书籍
kē-yuèdú DE shūjí
"can-read’s book “books that can be read, readable books”

However, the following contrasts show that the trisyllabic kè+VV forms are different from the disyllabic kè+V compounds. Compare:

12. a. 可怕的事
kē-pà de shì
terrible’s thing
"a terrible thing"

b. 可疑的人
kēyí de rèn
suspect-able’s person
"a suspect"

c. 可加工的材料
kē jīgōng de cáilìào
can be processed’s material
"process-able material"

d. 可造就的人
kē zuòjiǔ de rèn
can be trained’s person
"a trainable person"

Within disyllabic compounds, the auxiliary kè 仍 cannot be substituted with the free standing counterpart kēyí in the language, as seen in (12a-b), however within trisyllabic kè+VV forms, kè and kēyí are interchangeable. The fact that only in disyllabic forms, kè cannot be changed into kēyí indicates that only disyllabic forms are compounds whereas the trisyllabic ones are equivalent to phrases. The following examples show even more clearly that the trisyllabic kè+VV and the disyllabic kè+V are not simply different but indeed belong to two distinct syntactic categories.

As we can see, only disyllabic kè+V forms can be used as adjectives whereas all longer kè+V adjective are either not found in the language, or are ill-formed by this type of process, even if the verbs used in these two forms are synonyms (i.e., yí = huīyí “doubt,” kào = yīkào “rely” xìn=xīn “trust”), as seen in (13). This shows clearly that all longer forms are incapable of undergoing a category change from [Aux V] verbal expressions to [Aux-V] adjectives. In other words, only disyllabic [Aux-V] forms are allowed to form adjectives while the trisyllabic ones are prohibited from doing so. This is clear-cut evidence that trisyllabic forms are differentiated from the disyllabic [Aux-V] forms in the language and cannot be properly explained according to traditional morphology. In fact, this phenomenon was discovered only recently by the application of minimal word effect in the language (Feng 2000).
Given the minimal word theorem and the analysis above, a Templatic Constraint is therefore expected to be formulated in order to capture the category changing within all $\text{Aux} + \text{V}$ forms. It can be seen in (14).

14. **Templatic constraint on categorical change**\footnote{\cite{91,96a}}

\[
[k\text{+}V] \rightarrow \text{Adjective} / [k\text{+}V]_{\text{mod}}
\]

"A $k\text{+}V$ form undergoes a process of category changing, if it is a prosodic word."

Obviously, without the notion of MinWd (PrWd), the contrast between the disyllabic $k\text{+}V$ and the tri- or bi-syllabic $k\text{+}V$ forms revealed in the language will be lost, and most importantly, the grammar, which would make a strict distinction by the Templatic Constraint for the morphological process to take place, will be lacking.\footnote{\cite{98}}

**Minimal word as a condition for morphosyntactic operation**

In Mandarin Chinese, there are many A(djective)+N(oun) compounds such as 大米 “big-rice, rice,” 大汉 “big-man, burly fellow,” 小号LIN “little+pigtail,” etc. Traditionally, most of the A+N forms such as 大老虎 “big tiger,” 小号LIN “little umbrella,” etc., have always been considered phrases, rather than compound words, even if it has been recognized that the A+N combinations are not freely constructed (Zhu 1980), as shown in the following contrasts (de in Chinese is a possessive marker and a relative clause complementizer):

15. **Semantic gap**

\begin{itemize}
\item 白纸
\item 白的纸
\item 白 de zhi
\item 白 de zi
\item “white”
\item 白 de shi
\item 白 de shi
\item “white”
\item *
\item 白 de shi
\item 白 de shi
\item “white”
\end{itemize}

Alternative forms (but semantically not equivalent)

\begin{itemize}
\item 大米
\item 大的米
\item 大 de mi
\item big de rice
\item “rice”
\item big de rice
\item “rice”
\end{itemize}

Recently, Shih (1986), Dai (1992), Sproat and Shih (1991, 1996a), Duanniu (1998), Chen (2000) and others have argued that the bare A+N forms exemplified above should all be considered compounds, rather than phrases. Among the evidence supporting this analysis, the strongest is this: the A in all A+N forms cannot take a modifier like 大 de “very,” for example:

16. *很大树
\*heu da shu
“very big tree”

\begin{itemize}
\item *很大树
\item *heu da shu
\item “very big tree, very big trees”
\end{itemize}

Such syntactic behavior, therefore, forces one to conclude that the A+N forms are not phrases because there is no reason why the A cannot be modified if the [A+N] is a phrase, as compared with English.

17. little umbrella

\begin{itemize}
\item little umbrella
\item *very little umbrella
\item blackboard
\item *very blackboard
\item small-pox
\item *very smallpox
\end{itemize}

In English, the A of an [A+N] form cannot be modified if the [A+N] is a compound. In Chinese, however, the A in all of the A+N forms is not allowed to be modified. Thus, it is reasonable to consider them as N\* modifiers (Sproat and Shih 1991: 571). However, what we found is a clear distinction between different prosodic entities with different syntactic behaviors among all A+N forms. That is, disyllabic AN forms (if not all) behave differently from the longer ones systematically. To see this, let us begin with Sproat and Shih’s (1991) generalization about the adjective ordering of “SIZE” and “COLOR” in noun phrases.\footnote{\cite{98}} First, to observe:
Based on mounting evidence in different languages, Sproat and Shih (1991) generalized an Adjectival Ordering Restriction (AOR), which says essentially that the AOR – [SIZE > COLOR] – obtains if the adjectives involved are hierarchical direct modifiers. This is argued to be a universal constraint for the ordering of multiple adjectival modifiers, not only in English but also in Chinese (and many other languages; see Sproat and Shih 1991).

Given this constraint, a clear-cut distinction emerges between disyllabic AN forms and trisyllabic AN forms. For example (taken from Feng 2000):

18. SIZE COLOR NOUN

<table>
<thead>
<tr>
<th>little</th>
<th>black</th>
<th>umbrella</th>
</tr>
</thead>
<tbody>
<tr>
<td>*black little umbrella</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xiǎo</td>
<td>hēi</td>
<td>yǔnái</td>
</tr>
<tr>
<td>*hēi xiǎo yǔnái</td>
<td></td>
<td></td>
</tr>
<tr>
<td>小黑</td>
<td>雨伞</td>
<td></td>
</tr>
<tr>
<td>*black big plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>dà</td>
<td>bái</td>
<td>pánzi</td>
</tr>
<tr>
<td>*bái dà pánzi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>大白</td>
<td>盘子</td>
<td></td>
</tr>
</tbody>
</table>

Clearly, only (if not all) disyllabic AN forms can violate the universal constraint of [SIZE > COLOR] whereas three (or more) syllable AAN forms must all obey this constraint. Once again, we see that the trisyllabic AAN forms, like all other trisyllabic forms (V+OO, Aux+VV and V+RR), inherently lacks the properties exhibited in disyllabic forms. Why is this? Traditional grammarians would answer this question immediately by saying: because the ones that can violate the general constraint are compounds. This is indeed correct because in English the [SIZE > COLOR] order can also be violated if the [SIZE+N] is a compound. For example,

19. Trisyllabic AN

* COLOR > SIZE

| 白大盘子 |
| *bái dà pánzi |
| “White big plate” |
| 红小兵 |
| hóng xiǎo bīng |
| “red small-soldier, the red guard” |
| 黑小雨伞 |
| hēi xiǎo yǔnái |
| “red small umbrella” |
| 黑小计算机 |
| hēi xiǎo jìsuànjī |
| “black small computer” |
| 红大熊狗 |
| hóng dà xiónggǒu |
| “black big panda” |
| 白大萝卜 |
| bái dà luóbo |
| “white big radish” |

| 绿小葱 |
| *xiǎo de cōng |
| green small scallion |
| 红士兵 |
| hóng sī bīng |
| “red soldier” |
| 黑小猪 |
| hēi xiǎo zhū |
| “black little pig” |
| 白小鸭 |
| bái xiǎo yā |
| “white little duck” |

The inseparability of the [SIZE+N] forms in the [COLOR+[SIZE+N]] environment confirms the analysis that the [SIZE+N] forms in (19) and (21) must all be compounds, which makes a reasonable exception to the general constraint on ordinary phrases, as we would expect in English.
However, a question arises once we adopt the above analysis, because it would imply that the ones that must obey the general constraint are phrases. This must be so, or there is no reason why they would behave differently from the ones that violate the \([\text{SIZE} > \text{COLOR}]\) constraint if both AN and AAN are compounds. In other words, if only compounds can violate the constraint (cf. red smallpox), the ones that must obey it should not be compounds (cf. *red small umbrella*). However, as we have seen above, there is evidence that all A+N forms in Chinese are compounds, because none of them can be modified by a degree adverb like  hen “very” (cf. *very blackboard*). Given this, we are left with a paradoxical situation: according to the \([\text{SIZE} > \text{COLOR}]\) constraint, the ones that obey it must not be considered compounds because only compounds can disobey it; but according to the modifier  hen test, all AN forms must be compounds regardless of whether they obey the \([\text{SIZE} > \text{COLOR}]\) restrictions or not.

How can we resolve this dilemma? While other analyses are plausible (see note 15), I would like to suggest, first, that the ones that disobey the \([\text{SIZE} > \text{COLOR}]\) constraint are unquestionably compounds. However, they are not compounds in general, rather a specific kind, say, lexical compounds. By lexical compound I mean one that is generated in the lexicon governed by (prosodic) morphological rules.

What about the ones that must obey the \([\text{SIZE} > \text{COLOR}]\) constraint? Regarding the  hen “very” test given above, they cannot simply be treated as phrases, but they cannot be lexical compounds either. Following Feng (2001), I would like to suggest that they are syntactic compounds, which means that they are formed in syntax, and are therefore visible to the syntactic constraint of \([\text{SIZE} > \text{COLOR}]\). In fact, whatever they are is not the central issue to be addressed here. The point which I am making concerns the following fact: only (if not all) disyllabic forms are able to take the \([\text{COLOR} + \text{SIZE}]\) structure, while poly syllabic forms all fail to do so. The question then is: Why are the trisyllabic ones different from the disyllabic ones? Why must the difference be made by different numbers of syllables? Furthermore, how can we characterize the difference? Juxtaposed with the analyses in the previous sections, it is clear that the difference is due to whether an AN form is a PrWd or not. Thus, it can only be explained in terms of prosody. Similar to the minimal word effect on VO and AuxV forms discussed above, this phenomenon (SINGULAR) can best be accounted for in the same way as minimal word effect. That is,

\[\text{22. Minimal word constraint on AN forms in Chinese} \]
\[\text{AN-Compd} = \text{PrWd} \]
\[\text{A AN (lexical) compound is a PrWd.} \]

Here, we do not exclude the possibility that the polysyllabic AN forms are (syntactic) compounds, but they must be different from lexical compounds. If we adopt the classification of lexical compounds and syntactic compounds, we have good reason to say that the requirement of \([\text{A+N}]_{\text{PrWd/Compd}}\) in the \([\text{COLOR} + \text{SIZE} + \text{N}]\) structure follows directly from the minimality constraint: a lexical compound of \([\text{A+N}]\) forms must be a PrWd. Thus, in the environment of \([\text{COLOR} + \text{SIZE} + \text{N}]\), the application of the Prosodic-Morphologic constraint (22) will give rise to the following result: \([\text{COLOR} + \text{SIZE} + \text{N}]_{\text{PrWd/Compd}}\). The present theory also predicts that trisyllabic AAN forms cannot be lexical compounds, their components are still visible to certain syntactic processes (i.e., the phrasal restriction of \([\text{COLOR} > \text{SIZE}]\)).

If the above analysis is correct, it provides additional evidence for the argument that the minimal word in Chinese is the most harmonic prosodic word which is extremely active in a variety of constructions in the language.

Theoretical implications and empirical consequences

We have discussed several different syntactic and morphologic constructions in the present study: the Verb+object, the Auxiliary+Verb and the Adjective+Noun. We have also seen that all these different syntactic forms share a common property. That is: the trisyllabic ones are syntactically different from the disyllabic ones systematically. To be more specific, only the disyllabic ones exhibit lexical properties, and therefore only the disyllabic ones can be (lexical) compounds. Thus, for VO forms, only the disyllabic ones can take an object; for AuxV forms, only the disyllabic ones can be modified by a degree modifier like  jīcháng “extremely”; for AN forms, only the disyllabic ones can violate the \([\text{SIZE} + \text{COLOR} + \text{N}]\) phrasal constraint. Contrary to the case of disyllabic, all trisyllabic forms of each of the three constructions syntactically deviate from the properties of being a (true) lexical item, for example: the separable property and the inability to take a (post-verbal) object for all trisyllabic VOO forms; the inability to undergo the process of category changing for all trisyllabic AuxV forms; and the obligation to strictly follow the phrasal constraint \([\text{SIZE} + \text{COLOR} + \text{N}]\) for all trisyllabic AN forms.

It is possible, however, for one to suggest a different analysis for the trisyllabic forms and that is the AAN forms may reasonably be treated as phrases with a \([\text{SIZE} + \text{COLOR} + \text{N}]\) order, or compounds using the  hen test. However, it does not matter how one analyzes them, the distinction between the disyllabic and the trisyllabic structures will still pertain. The syntactic contrast cannot be explained
away by any analysis that overlooks the disyllabic and the trisyllabic distinctions. The facts brought to light in this study are quite striking: the distinctions among all three types of forms are not only syntactic, but also prosodic. In fact, their different syntactic behaviors were not discovered and will not be fully understood until the prosodic distinction is brought to light. In this sense, it is reasonable to say that the study of prosody has revealed some important prosodic-syntactic phenomena that would otherwise be a mystery in the language.

As we have seen, the prosodic distinction in all three different structures is centered upon the basic domain of disyllabicity. Why is this so? The minimal word theorem provides the best explanation and it is simply the legitimacy of being a PrWd in the language. The Chinese language is, therefore, a language that is extremely sensitive to the prosodic domain. Actually, it is the domain that permits only disyllabic forms to have the priority to be or become compounds, and it is also the domain that prevents trisyllabic forms from entering into the realm of lexical compounding. As a result, a boundary in Chinese morphology can be set between what is a compound (PrWd applies in morphology) or permitted to be a compound (PrWd applies in syntax), and what is forbidden from being a lexical compound, or at most a syntactic compound.

It is well known that in Prosodic Morphology, the core area of previous investigations has focused mainly on reduplication and infixation. The present study, however, extends the notion of PrWd into the area of compounding and its interaction with syntax. For all three types of forms discussed above, we have seen that the minimality constraint indeed controls the word formation of compounding in Chinese. That is, a compound (or more specifically a lexical compound) must first be a PrWd, even if a PrWd is not, by necessity, a compound. This conclusion has several implications in Prosodic Morphology. First, the Templatic Constraint not only determines morphological operations like reduplication and infixation, but also controls the word formation of compounding in languages like Chinese. This raises a question for future study as to why and how the Templatic Constraint could also control compounding. Furthermore, it is clear, by now, that the minimal word requirement functions in Chinese. Yet, when it does, it not only affects word formation, but also syntactic structures in a way that influences the formation of well-formed sentences. Surprisingly, it seems that the MinWd may also circumscribe certain syntactic phrases, so that the native speaker’s intuition about what is considered a “word” is unquestionably affected by the prosodic notion of MinWd. The final question then is how and to what extent prosody affects syntax, this question is extremely important for theoretical as well as empirical inquiries in future research.

4 Path of motion:
Conceptual structure and representation in Chinese
Chengzhi Chu

With the understanding that language is an experientially-based product of the human mind as well as a reflection of how speakers of a language structure the perceptions of reality, this chapter presents a characterization of the conceptual structure for Path of motion events and illustrates how the conceptualization of Path of motion is represented in Mandarin Chinese. Path is the route followed by the moving object (i.e., Figure) in a motion event with respect to the reference objects (i.e., Ground) (Talmy 1985; Chu 2008). For motion conceptualization and representation, Path is the central and defining property. In human cognition, Path is a conceptual complex consisting of several basic elements. In representing Path properties on the linguistic surface, Mandarin Chinese demonstrates a number of language-specific properties.

Path as the defining property of motion

By claiming here that Path is the defining property of motion, it means that only when the Path of the motion is profiled and overtly represented on the linguistic surface is it an event construed and realized in language as a motion event. Otherwise, it may be conceptualized as a different type of event but not as a motion event, despite the assertion of movement of some kind. Compare the two sentences in (1):

(1) a. 孩子跑进了屋子里。
Hǎizi pǎo jìn le wūzǐ lǐ.
child run into ASP' room inside
“The child ran into the room.”

I would like to thank Ying-che Li, Roderick A. Jacobs, Janet Xing and the anonymous referees for comments and discussion on drafts of this chapter.
the form of a possessive construction, it appears as two separate noun phrases (see Teng 1974). The assumption of a possessive relationship is an inference from context.

8 See LaPoile and Pax (2006) on why the whole practice of referring to languages as “SVO,” “SOV,” etc. is problematic.

Chapter 2

1 Lyons (1999: 278) expresses this relation in a different way, i.e., “definiteness is the grammaticalization of identifiability.”

2 Further evidence of the clustering of animacy and definiteness includes noun incorporation and verb agreement. Cross-linguistically, the least definite and/or animate arguments are most likely to be incorporated into verbs, and least likely to trigger the verb agreement (Lyons 1999: 207-214; Croft 2003: 128-132, among others).

3 The editor of this volume noticed that when suon meaning the modification marker de, (3a) sounds better. We agree with this intuitive judgment. The reason may be that de is a declarative marker (Lu 1999) in nature. Suon-de therefore emphasizes the declarative meaning, “with no left-over, complete, entire,” thus differing from the more referential suon meaning all, which is more often used as determiners than as adjectives. The syntactic difference between all and entire, whole can be seen in their respective distribution as well.

4 American English speakers tend to omit the definite article before one in 8a, but British English speakers allow the before one.

5 The cross-category identifiable hierarchy order is: noun > verb > adjective > functional words. The order is consistent with the order of language acquisition.

6 Few native speakers whom I consulted accept this sentence if the comma between in May and last year is omitted. In such a case, the two time units function as a phonological chunk, which can be regarded as the contracted variant of in May of last year.

7 One may ask why the Chinese counterpart of May of last year is qinian de woyou, the order of which is opposite to that in English. This may be attributed to the fact that English uses the preposition of here while Chinese uses the postpositional clique de, which equals to the English ’s. In other words, the Chinese qinian de woyou syntactically equals to the English last year’s May.

8 For ease of comparison, the glosses focus only on word order. The morphological details, such as the fact that nel in 13e is the combined form of in el (lit. “in the”), are omitted.

9 German is a so-called V2 (Verb Second) language. It is not a strict SVO language. It has many SOV language features, especially in subordinate clauses.

10 Looking at all the data from (9) to (16), we find an interesting pattern: the words meaning “May” tend to take an adposition while the words meaning “last year” do not, except in Russian and Chinese, where both take or do not take an adposition respectively.

11 Some new treatments of adverbial placement have emerged since then. For example, Nakamura (1997: 266-270) views the pre- and post-verbal adverbials as “subject-oriented adverbs” vs. “process adverbs,” within the frame of Cognitive Grammar. To Nakamura, the post-verbal adverb characterizes the manner of the process, in the sense that the speaker mentally scans the process sequentially, while the preverbal adverb characterizes the entire verbal process, “converting sequential scanning into summary scanning.” For example, He foolishly answered the question means “It was foolish for him to answer the question” or “the very fact that he answered the question was foolish” while He answered the question foolishly means “the manner reply with which he answered the question was foolish.” In other words, the post-verbal adverb is a “salient figure,” whereas the preverbal one becomes a “background.” The terminology has been changed, but the basic dichotomy between old and new information still holds.

12 When a reply is an indirect quote, “say” is felicitously required. Liu (2001) treats it as a complementizer in Chinese.

13 In a marked case, huidiū can be referential, such as in Tā shuōle wǒ shēnme huidiū? (“What bad things did he speak of me?”). Notice, sān-tiāo is unlikely to appear when huidiū is referential. Thus, the effect of identifiability hierarchy on word order remains.

14 For example, Zhu (1981: 110-124) regards all post-verbal nominal units including duration/frequency objects as “existential objects.” Similarly, he also treats the post-verbal nouns in existential sentences as “existential objects.”

Chapter 3

1 Note that the result of this reasoning may end up with a simple statement like: “A minimal word is just a foot.” Why, then, do we need the notion of “minimal word” if it is indeed a foot? Note that, without the Foot/PhWord alignment, there is no explanation for why the size of a word (morphology) should coincide with a foot (prosody). Here, following McCarthy and Prince (1990, 1998), I will assume that the F >> M is the fundamental hypothesis in Prosodic Morphology.

2 For example, in Chinese there are many trisyllabic as well as quadrissyllabic compounds which are obviously beyond the size of a PhWord. While it is not the purpose of this chapter to discuss the variety of compound formations, it is important to point out that it is entirely possible to derive polysyllabic compounds in Prosodic Morphology within the Optimality Theory. For example, the Parse-all-Syllable requires that every form be fully footed. This demands multiple feet in longer words. Yet, the ALL-Foot-Lift requirement will never be completely satisfied in words which have more than one foot. Now, under minimal violation of All-Foot-Lift, a multifoot form is allowable but it must have its feet as close to the beginning of the word as possible (see McCarthy and Prince, 1998: 298). Given this and the language-specific constraint that every syllable is a morpheme in Chinese, polysyllabic compounds are allowable and probably predicted: The trisyllabic (es-cs) compounds will be more optimal than (es-es) because only in the former is the initial foot closer to the beginning of the compound and therefore the better candidate in competition with the (es-es) forms.

3 For example, Huang (1984) proposed a Phrases Structure Condition (PSC) demanding that no two constituents be allowed after the main verb. This works perfectly in cases where a VO (or VR) co-occurs with an object (or a duration/frequency expression). That is, if a VO/VR can take an object (or a complement) like (8a-’b’), it must be a compound and if it cannot, it is a phrase. However, as Zhang (1992) has pointed out, the PSC cannot determine whether a VO/VR is a compound or a phrase if there is no second constituent (complement) after it. The present theory, however, predicts a categorical
distinction: all trisyllabic VOO (as well as VRR) are phrases regardless of whether there is a second constituent or not. As we can see below, the present analysis generalizes a prosodic condition of what can/tid not must be compounds and what must be phrases (or at least have phrasal properties) in the language.

4 In Wang’s study, there is a total of twenty-five VO forms examined by native speakers. In addition to the ones given in Table 3.1, they are shēng bō “to work,” jiē hūn “get married,” xǔ hùn “off work,” zhùn shēn “turn the body,” hào dì “fall on the floor,” hàn hǎi “talk words, chat,” etc. The total average of word-judgments is 95.6%, giving only 4.4% of phrase-judgments among all twenty-five forms. It would not be surprising if the judgments varied, even tremendously, when other forms and methods were used. However, for the present purpose, it is enough to see how extremely the native speaker’s judgments deviate from linguistic analyses, and how highly the judgments converge upon the disyllabic.

5 For example, by Huang’s PSC (see note 3), all of the VO forms, except the last one, are phrases because no second constituent is allowed after the four VO forms, for example:

i. *他睡了一天。
Tā shuì-jiào le yī tiān.
He slept for a day.

ii. *他洗了三次。
Tā xǐ-zǎo le sān cì.
He took a bath three times.

iii. *他跑了两次。
Tā pǎo-bù le liǎng cì.
He ran twice.

iv. *他念了三个小时。
Tā niàn-zi le sān gè zhōu.
He read three hours.

v. 他担心情况会有变化。
Tā dān-xīn qíngkuàng hui yǒu biànhuà.
He worried that the situation would change.

6 There are exceptions to this generalization. However, these exceptions do not affect our analysis here, because none of them is able to form a VO compound in the language.

7 This is to say that the ones that can (if not yet) be lexicalized as compounds must all be PrWds. What is important to note here is this: polysyllabic VO forms have never been tested as lexicalized compounds in the language, because, according to the present theory, they violate the Templatic Constraint: VO-Comp = PrWd.

8 For example, the trisyllabic forms such as shū-mù “soak mushroom,” use delaying tactics,” jī yīgǎ “squeeze toothpaste out of a tube, be forced to tell the truth bit by bit,” etc., are highly idiomatized, but they can never function as compounds when examined using transitivity, aspect making, the PSC test, as well as native speakers’ intuition.

9 This may lead us to the following conclusion reached in Feng (1997). In Chinese, a compound must be a PrWd, while a PrWd may not, by necessity, be a compound. This raises an important question about whether or not the MinWd effect can go beyond the hypothesis of P >> M. The facts given in this chapter suggest a positive answer. That is, P >> S (prosody dominates syntax). If this is so, the next question is to what extent this hypothesis can hold, a question that has been raised in previous studies (Zec and Inkela 1990; Truckenbrodt 1995; Feng 1995; Zubizarreta 1998; among others) and intensively investigated in Feng (2000, 2005).

10 This analysis allows us to conclude that the disyllabic VO forms are not a single syntactic category in the language because they contain prosodically minimal words (compounds) and prosodically minimal phrases (including idiomatized and free phrases). On the other hand, the trisyllabic (or polysyllabic) VO phrases belong to a purely syntactic category, because they can only be phrases and can never interact with morphology through prosody, which is a crucial difference between the disyllabic and trisyllabic phrases.

11 The double “VV” used here refers to a “disyllabic V,” henceforth, “NN” for a “disyllabic N,” etc.

12 The auxiliary ke can also be analyzed as an affix like “able” as seen in (14). In this case the Templatic Constraint can still hold, because only disyllabic [ké+V] can function as an adjective, and all longer forms fail to do so. Thus, there are no lexical items like *[fēicháng kě-VV] in the language. The reason why I analyze the [ké+V] forms as a case of category changing is illustrated in examples like the following:

i. 这种人可靠不可靠 / 可信不可信。
zhè zhǒng rén kě ào kě bù ào / kě xìn kě bù xìn.
This type person can rely can not rely, can trust can not trust.
“This type of person can either be or not be reliable/trustworthy or not.”

ii. 我们现在只可靠自己的努力不可靠别人的帮助。
Wǒmen xiànzài zhǐ kě ào zhìjǐ de nǔlì bù kě ào bié rén de bāngzhù.
We now only can rely on self’s endeavor not can rely on other’s help.
“Now we can only rely on our own endeavors and not on the help of others.”

iii. 我的朋友非常可靠 / 可信。
Wǒ de péngyou fēicháng kě ào / kě xìn.
I ’s friend extremely reliable/trustworthy.
“My friends are extremely reliable/trustworthy.”
Thus, "kē-láo/xún" can be used as a phrase (i–ii) and also can be lexicalized as a compound through category changing (iii) according to the present analysis.

13 Similar to the Aux+V forms discussed above, the process of category changing can also be observed in VO forms. For example:

<table>
<thead>
<tr>
<th>Chinese Character</th>
<th>Mandarin Pinyin</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>埋头 (mián tóu)</td>
<td>*mián tóu</td>
<td>bury-head (head) read-book</td>
</tr>
<tr>
<td>&quot;To study in a manner of immersing oneself in it, to immerse oneself in the study.&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>开颅 (kāi lú)</td>
<td>*kāi lú</td>
<td>open</td>
</tr>
<tr>
<td>&quot;To fight shoulder to shoulder (side by side).&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>拖手 (tuó shǒu)</td>
<td>*tuó shǒu</td>
<td>drag</td>
</tr>
<tr>
<td>&quot;To investigate from door to door.&quot; (&quot;door-to-door investigation&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>变法儿 (biàn fā'ē)</td>
<td>*biàn fā'ē</td>
<td>change-method (method) disturb</td>
</tr>
<tr>
<td>&quot;To disturb in various ways&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These examples show that a VO form can be used as an adverb only if it is a PtWd. This is so because all trisyllabic VO forms used in this way will cause an ungrammatical consequence as seen above. Thus, the Templatal Constraint is: VO ➔ Adverb: [VO]emph i.e., "a V+O form undergoes a process of category changing, if it is a prosodic word." This provides additional evidence for the Templatal Constraint on Category Changing in Chinese.

14 "≻" means "X precedes Y" or more specifically, "X is further from the head than Y" in Sproat and Shih's study. The pronominal adjectival modifiers examined by Sproat and Shih (1996a) actually include a successive hierarchical schema: QUALITY > SIZE > SHAPE > COLOR > PROVENANCE. Here, since only the order of [SIZE > COLOR] is directly relevant to the present analysis, other relations are omitted.

15 One possibility is to use "frozen compound" vs. "lexicalized compound" to capture this difference, which is plausible under the classifications of different types of lexicalization, that is, the ones that have lost their internal structures (frozen compound) and the ones that retain their internal structures (lexical compounds), as discussed in Liberman and Sproat (1992: 514–515). In this respect, once again, the same prosodic pattern observed in the present study holds. No trisyllabic AAN lexicalized compounds (retain internal structures) can be frozen and the frozen ones (lost internal structures) can only be diaylable.

16 The assumed syntactic compounds are analyzed as being formed in syntax through X0 adjunction in Feng's (2001) study. The analysis of two levels of compounds in Chinese is supported by distinctions between lexical and post-syntactic compounds in Japanese proposed in Shibatani and Kageyama's study (1988) and between ordinary compounds and construct state nominals in Hebrew observed by Borer (1988), who argues that the ordinary compounds are formed in the lexicon whereas the construct state nominals are built in the syntax where the components are visible to syntactic processes.

Chapter 4

1 The following abbreviations are used in example annotations in this chapter: ASP "aspect marker," CL "classifier," PL "plural suffix."

2 The analysis here of the constructional meaning shared by (2) and (1b) obviously owes much to theories of Construction Grammar (Goldberg 1995; Taylor 1998, etc.). Construction Grammar claims that constructions have a basic status in language. Certain conventionalized aspects of both meaning and use are directly associated with particular syntactic constructions. Furthermore, "constructions that correspond to basic simple sentence types encode as their central senses, event types that are basic to human experience" (Goldberg 1998). In this sense, we say that the meaning of the construction instantiated in both (1b) and (2) is identically "someone doing something at some place" rather than "someone changing location through space."

3 Adopting the perspective of Construction Grammar, we could say that the fact of motion is suggested by the construction rather than by the individual lexical items. However, it is still clear that a Path expression is indispensable for representing motion events. As (1b) and (2) show, without Path, the construction would not be a motion event construction.

4 The prominence of Arrival and Departure in Path conception is consistent with the general tendency of human cognition to view the starting and ending portions of a process or event as more salient—and more attended to—than the other parts.

5 G1, G2 etc. in the formulas stands for different Ground objects represented in expressions. Chinese instantiations of Vector component combinations can be seen later in this section. To save space, I do not give examples here.

6 Similar to the Chinese instantiations of the three Vector components in (5) and their English equivalents are examples from many other languages in such studies as Azzi (1989), Talmey (2000), and Skibin (1996) for Spanish; Choi and Bowerman (1991) for Korean; Asher and Sabryrollies (1994) for French; and Narasimhan (2003) for Hindi.

7 The representation of Conformation types of Surface, Beside, Above and Beneath involves some complicated morpho-syntactic devices which will be discussed later in this chapter.

8 The Path complement 进 jin "into" in (10a) not only conveys the Conformation property of Inside, but also conveys it with the Vector element of Arrival. This kind of Path component conflation and lexicalization will be considered later.

9 Of course, English over is also polysemous. "Traversal + Above" is only one central sense of over (R.A. Jacobs 2004, personal communication. For details see Lakoff 1987, Tyler and Evans 2001).

10 Clearly, Backward can be viewed as a "compound" Direction which incorporates Forward and Returning properties. See the definition for Returning below.

11 English also categorizes a Side Direction in which the Figure moves in a direction perpendicular to the Figure's Facing Direction. The Side Direction is realized as the