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Research Article

The Generative Study of Chinese Separable Words

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Abstract

Chinese Separable Words have triggered heated debates in the past research. Different linguists have put forward with different definitions, properties, and defining criteria from different points of view. The separated form and the combined form of separable words are analyzed in this article, with a focus on the generating process. With the aim of offering a unified explanation of the generating process, we propose that the syntactic process of Chinese separable words, being the merge of phrases rather than head merge, is similar to the one in the noun incorporation structure of some dialects in north America. The noun element is usually a clitic morpheme, and cannot be used alone, which means that it needs to be combined with verbs or modifiers. In the generating process under the guidance of phase theory, the nominal lexicon in the structure first generates nP, dP or NP, and then merges with V to generate VP. This analysis can explain the process of elements insertion and the clitic property of the noun. The separated structure depends on the insertion of some modifiers, which can be aspect markers, adjectives, possessors or quantity expressions. With insertion, the verb and the noun are separated, thus the structure of separated form being separated; and without insertion, the structure of combined form is combined.

Keywords

Separable Words, Phrasal Movement, Modifier, Noun Incorporation

1. Introduction

1.1. Attributes of Chinese Separable Words

Separable words consist of two syllable morphemes, and the main structure is verb+objective, which can be separated or combined [1]. The second morpheme of separable words is a clitic one, and must be combined with other morphemes. If it is combined with a verb, then the combined status of separable words comes into being, such as *bang mang* 'help' in Mandarin Chinese; if the second morpheme is combined with adjectives or other words, the separated status comes into being, such as *bang ge mang* 'give a help'. As for the feature of separable words, there are different opinions such

as words [2-4], phrases [5], non-words/ non- phrases [6, 7]. None of these, however, provides a satisfactory unified account of the status and features of separable words. Wang and Yao [8] proposes three criteria to define separable words, which are clitic morphemes, restriction on collocations, belonging to other categories. Taking these criteria into account, we can draw a conclusion that separable words are not words or phrases, but a special form in languages.

1.2. Difference Between Separable Words and Phrases

Separable words are not phrases. The elements that can be

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inserted inside the separable words are limited, and are mostly quantifiers, adjectives or aspect markers. Whereas, the elements that can be inserted inside the phrases are relatively free-chosen. The second morpheme of the separable words is usually clitic; in contrast, the second element of a phrase is usually a free morpheme, which can be collocated relatively free with more partners, such as *xie wenzhang* 'write an essay'. Phrases can consist of two or more syllables or words, such as *chi pingguo* 'eat an apple', while separable words consist mainly of two syllables or two words, such as *da qiu* 'play basketball'. The objectives of phrases can be conjuncted, such as *chi li he pingguo* 'eat pears and apples'. Whereas, the second morpheme in separable words cannot be conjuncted, such as *chi kui he jing* 'take loss and surprise'. In contrast, we can only juxtapose the two whole separable words such as *chi kui* 'take loss' and *chi jing* 'take surprise'.

Separable words are also different from words. Words are fixed and cannot be separated, such as *fangfu* 'as if' or *zhizhu* 'spider'. Separable words can be combined and can also be separated such as *chi jing* or *chi le yi jing* 'take surprise or take a surprise'. Words must be inflected on the whole, and are unpredictable in semantics from its components, and the stress is usually on the first syllable, and are not separated in syntax, such as *congrong* 'calm', whose meaning is totally different from its components *cong* 'from' and *rong* 'contain'. These are the features that separable words do not have. The two elements in separable words are closely linked to each other, and can be used as one word on the whole, but the two elements can be separated in syntax. This feature is in contradiction with the Lexical Integrity Hypothesis (LIH) of words [9]. LIH holds that lexical items are syntactic atoms, which implies that neither their segments nor their semantic components are accessible to syntax. The elements of separable words can enter into syntactic generating process as one syntactic object, and generate structures with modifiers, such as *bang-le da+mang* 'give-perceptivity a big help'.

In conclusion, we propose that separable words are not words or phrases and are a special structure with its unique features in the evolution of languages. In our research, we aim to first analyze the similarities and difference between separable words and noun incorporation phenomenon in other languages, and then analyze the generating process of separated form and combined form of Chinese separable words under the guidance of phase theory, thus providing a unified account of its generating process.

2. Similarities Between Separable Words and Noun Incorporation Structure

2.1. The Features of Noun Incorporation

Noun incorporation refers to a syntactic object in which, the noun and verb are combined together to form a compound verb [10]. The noun and the verb can also be separat-

ed in syntax, expressing the same meaning. Noun incorporation are mainly found in polysynthetic languages in the dialects of north America, Siberia, and north Australia etc.. In terms of morphemes, the incorporated noun can be separate, or clitic. In phonology, the whole noun incorporation forms one stress domain, with the original stress on the noun being weakened or even lost totally. In syntax, the nouns are mainly the thematic or the accusative element of the verb. In some languages, nouns with modifiers can also be incorporated with the verb. In discourse, the majority of noun incorporation structures have discourse referential penetration ability. The pronouns can be co-indexed with the incorporated noun. In the dialect of Mapudungun in Chile, (1a) is non-incorporated structure, (1b) is the incorporated structure.

Mapudungun

(1) a. *Ñichaokintu-le-y ta chipuwaka*. (Chilean dialect Mapudungun).

my father seek-PROG-IND.3sS the COLL cow

'My father is looking for the cows'

b. *Ñichaokintu-waka-le-y*.

my father seek-cow-PROG-IND.3sS

'My father is looking for the cows' [10] (p. 148)

From this example, we can find the attributes of noun incorporation which is either separated or combined in syntax.

2.2. Similarities Between Noun Incorporation and Chinese Separable Words

Chinese separable words can be combined or separated. Modifiers can be inserted between the separable words. The stress of separable words is on the first syllable, with the original stress on the nouns being weakened or lost totally. The second morphemes are generally clitic ones. The nouns are usually the accusative element of the verb. The nouns in separable words have no definite referential objects, and are singular forms. In non-incorporation structures, the nouns in some cases have the definite referential objects, and in some cases have no definite references. Taking these attributes into account, we can find that Chinese separable words are similar to the noun incorporation structure in other languages. Therefore, in this article, we would analyze the structure of Chinese separable words from the perspective of noun incorporation.

2.3. Analysis of Noun Incorporation

The analysis of noun incorporation is similar to the study of Chinese separable words, with two main directions in practice. One direction is the lexical analysis; the other is the syntactic analysis. Under the lexical point of view, similar to compound words, noun and verbs are merged by the rule of word formation (compounding) in lexical level. The representative scholars are Mithun [11] and so on. The verb root and the noun root get merged to generate one verb root. However, with the analysis of phonology, discourse and syntactic standards, Baker [10, 12] point out that noun incorpo-

ration structures are not words.

In contrast with lexical perspective, under the syntactic point of view, nouns and verbs originate from different syntactic positions, and are merged into one syntactic object with the syntactic method. The representative viewpoints include head movement, pseudo noun incorporation, base generation+semantic incorporation, remnant Nominal Phrase (NP) movement, head feature agreement, phrasal movement and so son. Among them, phrasal movement can get incorporated in the current generation grammar with its explanatory adequacy.

Barrie [13, 14], Barrie & Mathieu [15, 16] propose phrasal movement, under which, the moved element is a phrase, not merely a head. The argument for this viewpoint are that the incorporated noun may not be a noun root, but a noun phrase with modifiers such as adjectives, numbers, or even relative clause. With the phrasal movement, the incorporated nouns can be n Phrase (nP) (root), d Phrase (dP) (root with modifiers), Determiner Phrase (DP) (including determiners or possessors), K Phrase (KP) (including case markers), or Complementizer Phrase (CP) (including relative clause). The noun root has no discourse referential, while nP or larger syntactic objects have co-indexing ability. Therefore, the incorporated elements are not noun root, but a noun phrase.

3. Theoretical Framework

Given the similarities between noun incorporation and Chinese separable words, we then analyze the Chinese separable words from the perspective of noun incorporation, and illustrate the generating process of separable words under phase theory. Phrasal movement is based on Chomsky's phase theory, so, we would like to introduce the phase theory first.

Chomsky [17-19] propose phase theory. In phase theory, words are classified into lexical category and functional category, with lexical category including verbs, nouns, adjectives, prepositions, and functional category including C, T, v D and other functional categories. Syntactic generating is based on phases, with CP, v Phrase (vP), and DP being phases. Bošković [20] proposes the contextual phase theory based on the defects in Chomsky's phase theory. The highest phrase of extended projection of all lexical categories is a phase. Phase is contextual, and dynamic, in contrast to Chomsky's rigid, static phase theory. The new phase theory is dynamic, dependent on context. Nouns, verbs, and adjectives all project to generate phases. Bošković then points out that it is phase or phase complement that gets spelled out to the interface to be interpreted and articulated.

In the study of Chinese separable words, there are also scholars who adopted the generative grammar approach. Hua [21] proposes that Chinese separable words are not noun incorporation, with evidence based on Baker's [22] head movement viewpoint. Whereas, Baker's analysis of noun incorporation is limited to head incorporation, but does not cover the linguistic data of nouns with modifiers. Therefore,

the evidence for Hua's viewpoint is not sufficient. In this article, we believe that separable words and noun incorporation are similar to each other. Tang [23] proposes the viewpoint of noun incorporation. He argues that in example (2),

Chinese

(2) *Sheng ni de qi, zao ni de yao*

Anger you possessor angry, make you possessor rumor

'be angry with you, make a rumor about you'

This structure is generated with secondary analysis and noun phrase incorporation. Huang [24] proposes that the separable word structures are similar to another sentence structure, such as in (3),

Chinese

(3) a. *Ni jing ni de zuo.*

You sit-in you possessor demonstration

'You sit-in to demonstrate'

b. *Wo shi wo de wei*

I demonstrate I possessor demonstration

'I demonstrate'

c. *Ni jiao ni de yingwen*

you teach you possessor English

'you teach your English'

d. *Wo kan wo de baozhi*

I read I possessor newspaper

'I read my newspaper'

These two structures are both generated with the method of movement. Pan & Ye [25] point out that Huang's viewpoint is in contradiction with LIH, so they argue that the generation of separable words is, first "verb copy", then get nominalized before merging with light verb v, and finally with the cognate-object-construction PF ellipsis, the separable structure is generated. Separable words are not the generation of two separated morphemes, and the two morphemes are not even separated. Being separable is a false phenomenon. Separable words are the cognate-object structure of two-syllable intransitive verbs with other elements, whose generation is related to copy movement, nominalization, deletion in Phonological Form (PF), and so on. We have pointed out in sections above that separable words are not words or phrases, so Pan and Ye's analysis is not reasonable. What is more, we argue that the conversion of word category is not based on any theory. *bangmang* 'help' is a verb, and there is no reason for its beginning as a noun. Pan & Ye's viewpoint is in contradiction with Uniformity of Theta-assignment Hypothesis (UTAH) with thematic roles being assigned twice. Therefore, we would analyze the internal syntactic structure of Chinese separable words from the viewpoint of phrasal movement under phase theory.

4. Analysis of the Generating Process of Separable Words

4.1. Analysis of Being Able to Be Separated

Modifiers such as aspect markers, adjectives, possessors

or quantity expressions can be inserted into the separable words. The noun element is usually a clitic morpheme, and cannot be used alone. It can be combined together with a verb to form the original form of a separable word. Or it can be first merged with modifiers such as quantifiers, classifiers, possessors, or adjectives to generate NP, then merges with a verb to form the separated form, such as,

Chinese

(4) a. *Bang mang* (combined form)

Do help

'help'

b. *Bang ge mang* (separated form)

give classifier help

'give a help'

c. *Bang ta ge mang* (separated form)

help he classifier help

'help him'

d. *Bang ta yige da mang* (separated form)

help he once-classifier big help

'give him a big help'

Aspect markers of verbs can also be inserted into separable words to generate the separated form, such as,

Chinese

(5) a. *Bang le mang*

Help aspect-perfectivity help

'(have) Helped'

b. *Bang le ta yige da mang*

help perfectivity he one-classifier big help

'given him a big help'

c. *Bang wan mang le*

help perfectivity help confirming-le$_2$

'finished help'

d. *You wan yong le*

swim perfectivity swim confirming-le

'finished swimming'

Separable words are not words, and the two morphemes in them can be separated. This can also be proved by ellipsis structure.

Chinese

(6) a. *Wo zuotian youyong le, ni you le yong ma?*

I yesterday swim perfectivity, you do perfectivity swim ?

'I swam yesterday, and did you swim?'

b. *Ni AspecP [$_{Aspect}$ you$_i$+le $_{vP}$ [$_v$ t$_i$ $_{VP}$ [$_V$ t$_i$ $_{NP}$yong]]] ma?*

(7) a. *Wo tanwanqin le, ni tanwan qin le ma?*

   I play perfectivity piano le2, you play perfectivity piano le2?

'I have finished playing the piano, and have you finished?'

b. *Ni AspectP [$_{Aspect}$ tan$_i$+wan $_{vP}$ [$_v$ t$_i$ $_{VP}$ [$_V$ $_{NP}$qin]]] le ma*

In Mandarin Chinese, *le* can be divided into two categories, one is the sentence-ending *le*, marked as le$_2$, which is located at the end of a sentence, usually to confirm an event. The other is verbal *le* or the aspect marker *le* marked as *le*$_1$, which is located right behind the verb, usually to indicate the perfectivity of an event. In this article, we focus on the aspect marker *le*$_1$.

In the structure above, there is only Aspect Phrase (AspectP) and no Tense Phrase (TP). Here we follow the viewpoint that in article-less languages, there is no TP [20, 26, 27]. The tense meaning is expressed in aspect markers or time adverbials. So in this generating process, there is only AspectP and no TP.

Fu [28], Wang [29] argue that these structures are ellipsis structures. So, based on ellipsis principle, only phase and the complement of phase head can be elided, and other elements cannot be elided [20]. According to the contextual phase theory, the highest phrase of extended projection of every lexical category is phase. In these contexts, with the existence of the Aspect marker *le*, AspectP is the highest projection of verbal phrases. Thus, AspectP is phase. The head *you* 'swim' of vP is moved to the position of Aspect marker *wan* (perfectivity) to form a compound head and the complement of AspectP is vP [Verb Phrase (VP) NP]. So the elided part is the whole vP, including the noun *yong*. From this head movement, we can draw a conclusion that separable words are not a whole, and they can be separated, with each one working on its own. In the second example, *tan qin* 'play the piano' is the separable words. In the generating process, the head of this structure is "tan" (play), and with head movement, *tan* is moved to the position of Aspect marker *wan* (perfectivity) to form a compound head *tan+wan*, via the position of head v. This generating process proves that the second morpheme can get elided in the ellipsis structure, and the two morphemes of separable words can work separately on its own.

This is the illustration of the first morpheme, and the second morpheme can also work on its own. In the following cases, the second morpheme is moved to a position before the verb.

Chinese

(8) a. *Ta shu jiao de hao.*

He teaching teach de$_v$ good

'He teaches well.'

b. *Ta qiu da de hao.*

He ball play de$_v$ good

'He plays football well.'

c. *Ta wu tiao de hao.*

He dancing dance de$_v$ good

'He dances well.'

In these cases, the separable words are *tiao wu* 'dance', *jiao shu* 'teach', and *da qiu* 'play ball' respectively. Huang [24] proposes the deep structure of this form is the gerund form, then the head of gerund phrase moves to the light verb to get pronounced. We argue this process is not economical. The conversion of a word category is not reasonable either. There is structure as follows,

Chinese

(9) *ta jiao de hao*

He teaches de$_v$ well

'He teaches well.'

In this structure, there is no gerund form, but the verb

could still get pronounced. So with this comparison, there is no necessity for the existence of gerund form.

There are also structures in which the whole VP is moved, such as,

Chinese

(10) a. *Ta qiu da de hao*.

He ball plays de$_v$ good

'He plays football well.'

b. *Ta daqiu da de hao.*

He playing-football play de$_v$ good

'He plays football well.'

c. *Ta daqiu da qiu de hao.*

He playing-football play de$_v$ good

'He plays football well.'

Da qiu is separable words, in this structure, and it appears in front of the verb *da*, and there is no noun *qiu* following the verb *da*. So on the appearance, the whole separable words get copied and the noun in the original separable words get deleted.

The generating process of this structure can be analyzed from the perspective of *de$_v$* structure. In Mandarin Chinese, this *de$_v$* is different from another *de*. The latter one expresses some kind of belonging relationship or just a linker, between the modifier and the noun. In the structures above, we mark this *de* as *de$_v$*. There are two kinds of structures following *de$_v$*, one is to describe the status of the verb (descriptive *de*); the other is to describe the result of the verb (resultative *de*), and to modify the subject. In this section, *de* refers to *de$_v$*, if there is no special indication. In regard to the noun incorporation analysis, only the descriptive *de* structure is legal, in contrast, the resultative *de* is illegal in noun incorporation structure. For example,

Chinese

(11) a. *Ta qiu da de hao.* (descriptive de)

He ball plays de$_v$ good

'He plays football well.'

b. *Ta daqiu da de hao.*

He playing-football play de$_v$ good

'He plays football well.'

(12) a. **Ta qiu da de lei le* (resultative de)

He ball play de$_v$ tired le2

b. *ta daqiu da de lei le*

he playing-football play de$_v$ tired le2

'he was tired after playing football.'

(13) a. *Ta wu tiao de hao.* (descriptive de)

He dancing dance de$_v$ good

'He dances well.'

b. *Ta tiaowu tiao de hao.*

He dancing dance de$_v$ good

'He dances well.'

(14) a. **Ta wu tiao de lei le* (resultative de)

He dancing dance de$_v$ tired le2

b. *Ta tiaowu tiao de lei le.*

He dancing dance de$_v$ tired le2

'He was tired after dancing.'

According to Huang [24], both structures can be generated with the method of cognate copy and verb deletion. But here, the resultative *de$_v$* is not grammatical. The difference between the two structures is that the resultative element is to describe the subject, while the descriptive element is to modify the VP. With the strong clitic feature of *de$_v$*, different from Huang [24], we propose that the whole VP (including the noun) is moved to the head of *de$_v$* to form the compound head, *verb+de$_v$*. The noun also has the clitic feature, which is not as strong as *de$_v$*, or a weaker clitic feature. With the strong/weak clitic feature difference, the *de$_v$* gets merged with the verb, and the noun is left behind. In order to satisfy the clitic feature of the noun, with the cognate copy analysis, the whole VP gets copied, to generate a structure.

Chinese

(15) *Ta daqiu da de hao.*

He playing-football play de$_v$ good

'He plays football well.'

We propose the whole VP get copied and moved to a position of Focus Phrase (FocusP). Because in this kind of structure, there is the expression of Focus. So the structure is as in (16),

Chinese

Ta $_{FocusP}$ [daqiu da de hao]

In this structure, under cognate copy deletion, as in (17), if the verb is deleted, the noun is left, and before the noun is the subject, thus in the end, the subject and the noun form one structure. The clitic feature of the noun in separable words is satisfied with the subject. Sometimes there is a linker *de* between them to generate the appearing belonging relationship.

Chinese

(17) a. *Ta da qiu da de hao.*

He football play de$_v$ good

'He plays football well.'

b. *Ta de qiu da de hao.*

He possessor ball play de$_v$ good

He plays football well.

This proves the separable feature of the separable words. It can be combined or separated.

In the resultative *de$_v$* structure, the element following the VP is to modify the subject. If the verb in the copied VP is deleted, as in (18), (19), the noun would form a structure with the subject, the relationship between the subject and the element behind the VP would be ungrammatical. So the verb in the copied VP could not get deleted, and the clitic feature of the noun would get satisfied.

Chinese

(18) a. *ta daqiu da de lei le*

he playing-football play de$_v$ tired le2

'he was tired after playing football.'

b. **Ta daqiu da de lei le* (resultative de)

he football play de$_v$ tired le2

(19) a. *Ta tiaowu tiao de lei le.*

He dancing dance de$_v$ tired le2

'He was tired after dancing.'

b. *Ta tiaowu tiao de lei le* (resultative de)

he dancing dance de$_v$ tired le2

Because of the existence of de$_v$, the NP in separable words must be moved, otherwise, the structure would be ungrammatical.

Chinese

(20) a. *Ta tiao wu de hao.*

He dance dancing de$_v$ well

b. *Ta wu tiao de hao.*

He dancing dance de$_v$ good

'He dances well.'

This also shows the feature of separable words, which can be combined or separated.

As for the whole generating process, we follow the argument of Yang [30] that *de$_v$* is a light verb, and different from the traditional light verb v, this *de$_v$* has the externalized form and pronunciation. In this generating process, firstly, VP *da qiu* is generated and the adjunct *hao* is merged. Then the light verb *de$_v$* is extracted and gets merged. With the clitic feature of light verb *de$_v$*, the VP is moved to the head of v and the compound head *da+de$_v$* is generated. This strong clitic feature of *de$_v$* forces the movement of the verb, and the NP following the verb cannot be combined together with the verb any longer. The clitic feature of the noun is left unsatisfied. In other separated examples, the NP could be modified to be separated from the verb. Here in this structure, there is no modifier of the noun, so this is not acceptable for the noun because of the clitic feature. With cognate copy operation, the VP is copied and moved to the position of FocusP. So the existence of *de$_v$* also forces the VP to be copied. Thus the structure is generated.

Chinese

(21) a. *Ta daqiu da de hao.*

He playing-football play de$_v$ good

'He plays football well.'

b. *Ta$_k$ $_{FocusP}$ [$_{Focus}$ daqiu$_j$ vP [$_{spec}$ t$_k$ v' [$_v$ da$_i$+ de$_v$ [$_{VP}$ t$_i$ t$_j$ $_{Adjunct}$ hao]]]]].*

And with copy deletion, the verb in the Focus position can be deleted, and the verb in the v head position is kept. The structure is generated.

Chinese

(22) a. *Ta daqiu da de hao.*

He playing-football play de$_v$ good

'He plays football well.'

b. *Ta $_{FocusP}$ [$_{Focus}$ daqiu$_j$ $_{vP}$ [$_{spec}$ v' [$_v$ da$_i$+ de$_v$ [$_{VP}$ t$_i$ t$_j$ $_{Adjunct}$ hao]]]]*

Besides the *de$_v$* structure, we can also testify this viewpoint with topicalization. With topicalization, the second morpheme in separable words can also be extracted. In these structures, the verb should be followed by some resultative adverbials or aspect markers, for example,

Chinese

(23) a. *Mang$_i$ ye bangle t$_i$, fan$_j$ ye chi le t$_j$*

Help also give-perfectivity, dinner also eat-perfectivity

'Have helped and have had dinner.'

b. *Mang$_i$ ye bang t$_i$, fan$_j$ ye chi$_i$ t$_j$*

Help also give, dinner also eat

c. $_{TopP}$ [$_{Top}$ mang$_i$ $_{AspectP}$ [$_{Aspect}$ bang$_j$+le $_{vP}$ [$_v$ t$_i$ $_{VP}$ [$_V$ t$_j$ $_{NP}$ t$_i$]]]]

Topicalization is the noun phrases moved to the front position of the sentence, with a trace left in its original position. In separable words, the noun can get topicalized, which proves that the nominal element is a noun phrase, and the verb morpheme and the noun can be separated. In this topicalized structure, the second morpheme noun seems to appear alone. However, this structure must be in coordinate structure, with two or more clauses paralleling with each other. So actually, the clitic feature of the noun is satisfied with the Conjunction Phrase (ConjunctP).

In conclusion, the two morphemes in the separable words can work as a whole or can work separately.

4.2. The Generating Process of Original Structure of Separable Words

First, we would analyze the generation process of original form (or the combined form) of separable words. In the original form, there are only two morphemes, the verb and the noun, such as *bang mang* 'help'. In Section 2 above, we have illustrated that separable words are not words and are generated with syntactic merge. Based on this account, we have drawn the conclusion that the two morphemes in separable words are separated, the first one being a verb, and the second one being a clitic noun form. This structure is similar to the noun incorporation structure "verb+noun". In noun incorporation structure, first, the nominal element is extracted from lexical array and generates nP to get nominalized, so it can work on its own. With this opinion, in Chinese separable words, the nominal element first generates nP to get nominalized, too. This operation is to solve the problem that this nominal element couldn't work on its own, because it does not have a definite label, and cannot get into the generation process as an independent element. With the analysis of ellipsis and topicalization, we have illustrated the independent feature of the noun element. Therefore, in generating process, the noun element first generates nP. Then according to the phase theory, nP get merged with V to generate VP, then VP as an independent syntactic object, takes part in the proceeding computing process. The generating process of "bang mang" is as in (24).

Chinese

[$_{VP}$ $_V$ bang [$_{nP}$ [$_n$ mang]]]

The original form of separable words is an intransitive verb. The verb in the separable words is transitive, and needs an objective to have its thematic role satisfied. With the merge of noun, its thematic role gets satisfied, in accordance with UTAH. In case (24), *bang* is transitive, and *mang* is the thematic role of the verb *bang*. The merging of these two elements results in the satisfaction of the thematic roles, and

there is no need for other objects, so the whole separable words become intransitive. But, there are cases that some elements can follow this original form, such as (25),

Chinese

(25) *Bang mang zuofan*

Do help cooking

'Help cooking'

So how should we analyze this structure? In this kind of structure, the element following the separable words can only be an infinitive. "zuofan" is the infinitive form. We argue that this can be analyzed as apposition structure. *Zuofan* is the explanation of *mang*, to explain what action is taken, and they refer to the same action. Similar structures include (26),

Chinese

(26) a. *Bao jia sangqianyuan*

Quote price 3000 yuan

'Make a quote of 3000 yuan (RMB)'

b. *Qu jing daziran*

take view nature

'take the view of the nature'

In these structures, *jia* 'price' and *sanqianyuan* '3000 Yuan' refer to the same thing, and *jing* 'view' and *daziran* 'nature' refer to the same thing. These following nouns are the explanations of the former nouns, and they are appositions. With the same reference, they get the same case assigned.

Chinese

(27) a. *Qu jing daziran*

take view nature

'take the view of the nature'

b. $_{VP}$ [$_V$ *qu* $_{NP}$ [$_{NP}$ *jing* $_{Adjunct}$ [$_{NP}$ *daziran*]]]

4.3. Generating Process of the Separated Form of Separable Forms

The separated form of separable words is a structure with the two morphemes separated by some elements. The elements inserted can be the modifiers of the noun or aspect markers of the verb.

4.3.1. The Varied Form of Nouns with Modifiers

The modifiers of nouns in separable words can be quantifiers, classifiers, adjectives, possessors, or relative clause, for example,

Chinese

(28) a. *Bang ge mang* (classifier)

help a help

'make a help'

b. *Bang da mang* (adjective)

help big help

'make a big help'

c. *Bang ta de mang* (possessor)

help he possessor help

'help him'

This element is the modifier of the following noun, such as *da mang* 'big help', *ta de mang* 'his help'. We propose, in generating process, there are two possibilities for this structure. One is that the noun and the modifiers merge to generate a bigger NP, then NP merges with V to generate VP. The other one is that the two heads (verb and noun) merge, and the modifiers are left outside as an adjunct to generate the modifier stranding structure. We would illustrate the second possibility in next section. These two possibilities are both similar to noun incorporation structures.

We would first analyze the structure (28a) based on Barrie's phrasal movement. Barrie [13, 14] argues that in Noun incorporation, the nominal element first generates nP, then proceeds to merge with other elements. Thus, based on phase theory, in Chinese, if there is a modifier for a noun, the modifier first merges with nP, then the syntactic object "modifier+nP" merges with V to generate VP. When the modifier is a classifier, the nominal element first gets nominalized to get nP *mang*, then nP *mang* merges with classifier *ge* to generate Classifier Phrase (ClP) *ge mang*. The attributes of classifier and the attributes of clitic morpheme noun both require the head Classifier to attract the following noun to move upward to form a compound head "classifier+NP". Then ClP merges with V *bang* to generate $_{VP}$ [$_V$ *bang* $_{ClP}$ *ge mang]]*". The thematic role of the verb is satisfied with the merging of ClP *ge mang*.

Chinese

[$_{VP}$ $_V$(*bang*) $_{ClP}$ [$_{Cl}$ (*classifer+mang$_i$*) $_{nP}$ [$_N$ *n(t$_i$)*]]]]

In (28b) *bang da mang*, the modifier is an adjective. In the generating process, the nominal element *mang* first generates nP, then nP merges with an adjective to generate NP *da mang*. Here, the status of this NP with adjective modifiers in Mandarin Chinese is treated differently as NP, AP or DP [31, 32]. Bošković [20] argues that in languages without articles, NP or other highest projection of the noun is phase, and in languages with articles, DP is phase. In DP languages, adjectives are the adjunct of NP, whereas, specifiers and possessors are the heads of D. In contrast, in NP languages, adjectives, possessors and determiners are all adjuncts of NP. This can be testified by binding theory [33]. Following Bošković [20], Chinese is a language without articles, so NP or other highest projection (ClP) is phase in Chinese [26]. Adjectives, possessors and determiners are all adjuncts of NP in Chinese. So based on phase theory, nP *mang* 'help' first merges with adjective *da* 'big' to generate a bigger syntactic object NP *da mang* 'big help', and then NP merges with V *bang* 'give' to generate VP *bang damang* 'give a big help', and then proceeds to generate the whole structure.

Chinese

[$_{VP}$ $_V$(*bang*) $_{NP}$ [$_{Adjunct}$(*da*) $_{NP}$ [$_{nP}$ *mang*]]]

In case (28c), "bang ta de mang" (give him a help), the modifiers *ta de* 'his' seem to be possessors on the appearance. But we argue this is not a real possessor. The structure *ta de mang* is different from the structure *ta de shu* 'his book'. In the latter one, *shu* 'book' belongs to him, whereas, in the former structure, *mang* and *ta* have no belonging relationship.

Similarly, in the structure of *sheng ta de qi* 'be angry with him', *ta* 'he' and *qi* 'angry' have no belonging relationship, either. *ta* 'he' is the causer of *qi* 'anger', but not the owner of *qi*. Huang [24] proposes that these are fake modifiers, not real modifiers. Huang argues that this pseudo-belonging of [NP1 de NP2] is generated via structure reanalysis and the insertion of *de*. Originally, NP1 and NP2 have the relationship of agent and thematic or patient.

Therefore, we believe this structure has no belonging relationship. We argue that *ta* is the indirect object of *bang* 'give', is the dative case, and is the indirect object. *mang* is the direct object. In this multi-case structure, there is order superiority for merge, "direct object > indirect object >tool > locative" [12, 34]. In the varied form of separable words, the direct object first merges with V, then the indirect object is left. bang 'give' is different from the verb "give". "Give" can have two objects, the dative role and accusative role. bang has only accusative role, and cannot assign case to the indirect object. So in order for the indirect object to get case assigned, there are two methods. One is to merge ta with mang to generate ta de mang, to get the belonging relationship on the appearance. Then this structure merges with V to generate the varied separable form. The other method is to get another word gei to assign case for this indirect object, such as,

Chinese

(31) a. Wo bang ta de mang

I give he possessor help

I help him.

b. Wo $_{vP}$ [v bang$_i$ $_{VP}$ [v t$_i$ $_{NP}$ [ta de mang]]]

(32) a. Wo gei ta bang mang

I for he give help

I help him.

b. Wo [$_{vP\ Adjunct}$ [$_{PP\ prep}$ gei $_{NP}$ ta] $_{vP}$ [v $_{VP}$ [bang mang]

In this structure, gei, as a preposition, has the case assigning ability, so UTAH is satisfied.

4.3.2. The Varied Separated Form of Verb with Aspect Markers

Besides modifiers of noun, the verbs can also be modified. In examples as in (33).

Chinese

(33) a. *Wo bang le dian mang*

I help perfectivity a little help

'I help a little.'

b. *Wo bang wan mang le*

I help perfectivity help le2

'I finished help.'

In this varied form, there is an aspect marker following the verb. The phrasal movement viewpoint can account for this generating process. Based on phase, the nominal element *mang* first generates nP, then nP merges with an adjective *dian* to generate NP *dian mang*. Then the verb *bang* gets extracted to generate $_{VP}$ [$_V$ bang $_{NP}$ [$_{Adjunct}$ *dian* $_{NP}$[*mang*]]]. The head of VP is the verb *bang*, and then aspect marker *le*

gets extracted to merge with VP to generate AspectP. Li & Xu [35] points out the Chinese aspect markers are clitic element. Aspect markers have the attribute of attracting the verb to move to its existing position to form a compound head. So, in this process, the head verb *bang* moves up to the head aspect marker *le* to generate compound head *bang+le*, with NP *dian mang* being the complement of the VP. Later, other elements are extracted to generate the whole structure.

Chinese

(34) a. *Wo bang le dian mang*

I help perfectivity a little help

'I help a little.'

b. [$_{AspectP\ Aspect}$ (*bang$_i$+le*) $_{VP}$ [$_V$ t$_i$ $_{NP}$ [$_{Adjunct}$ (*dian*) $_{NP}$ [$_{nP}$ (*mang*)]]]]]

Compared with (34), there are cases that the whole separable words is followed by *le*. We argue that this *le* is *le$_2$*, which is located at the end of the whole sentence to confirm an event, but not the aspect marker *le$_1$* VP, such as,

Chinese

Wo gei bieren bangmang le.

I for others help le$_2$

'I helped others.'

The argument for being *le$_2$* is that no elements can follow this $_{le}$, such as,

Chinese

(36) *wo gei biren bangmang le zuofan.

I for others help le$_2$ cooking

In structure (33b) *wo bang wan mang le*, there is the resultative complement aspect marker *wan* (perfectivity). Pan & Ye [25] points out, the complement aspect markers in separable words are *gou* 'enough', *jin* 'all', *tou* 'completeness', *shang* 'connected', *hao* 'enough', *cheng* 'linked' and so on. The positions of complement are different from the aspect marker *zhe* 'continutiy', *le* (perfectivity), *guo* 'past' which express the abstract event and time meaning, and these three are Aspect markers. The former are an internal aspect inside the verb, and its meaning does not cover the whole sentence. Xia [36] treats this structure as V-R structure and is generated as a whole in the lexical array. Pan and Ye [25] uses the method of cognate-object copy to generate this structure. However, we believe that in this deletion, copy and deletion make the computing process more complicated and redundant. At the same time, there is no basis for the deletion operation, and this operation is random, so it has no theoretical analysis foundation. So cognate-object copy account cannot be applied to the generation of separable words.

We propose that this kind of structure is generated by head movement. This structure is treated as causative structure, in which there are two sub-structures: *bang mang* 'give help' and *mang wan* 'help is finished'. The first one is verb+object structure. The second one is "noun+adjective" structure. In generating process, firstly, the noun+adjective *mang+wan* are merged to generate the small clause. According to Bošković's contextual phase theory [20], the highest project is a phase. The highest projection Adjective Phrase (AP) of

adjective is phase. The the verb *bang* is extracted. In order for the generating process to be simple and economical, the head of small clause (AP) *wan* is moved to the head of VP *bang* to generate the compound head *bang wan*, and the whole structure has only one head. Therefore, the generating process is economical. Then the sentence ending *le₂* is extracted, and the whole structure is completed.

Chinese

(37) $[_{AspectP} [_{VP \ V} (bang+wan_j)[_{AP}[_{NP}(mang)Adj (t_j)]]] _{Aspect} le]$

4.4. Stranding Structure of Separable Words

In separable words, there is one structure in which, the verb and the noun are put together, and the modifiers of the noun follow the verb+noun structure, for example,

Chinese

(38) a. *Zhu dian'er yi* (separated structure)

Pay a little attention

'Pay a little attention'

b. *Zhu yi dian'er* (stranding structure)

pay attention a little

'Pay a little attention'

In this structure, (38a) is the varied form of separable words, *zhu* 'pay' is the verb, *dian'er yi* 'a little attention' is the modifier+noun form. The modifier is adjective structure. In the latter example, *zhu yi dian'er* 'pay attention a little' we can treat this as the movement of the head noun to merge with the verb. The modifiers are left behind. We call this the stranding separable words. This structure is similar to the modifier stranding of noun incorporation in the dialects of North America, for example,

Mapudungun

(39) *Juan ngilla-waka-fi-y Pedro*

Juan buy-cow-3.O-INDIC.3.S.Pedro

'Juan bought Pedro's cow.' [16] (p. 40)

We propose that this movement is caused by the clitic attribute of the nominal element. This clitic feature requires the noun to merge with another element. The nominal element can merge with a verb, or merge with the modifier. The noun first merges with the modifier to generate NP. However, in the following generation process, the head of NP can be moved to merge with the verb, like noun incorporation in (39) to generate the original form of separable words. And the modifiers are left behind and the stranded structure is generated. According to Bošković [20], adjectives, possessors, and determiners are all adjuncts of the NP. The movement of head noun to the head of V is not in contradiction with Head Movement Constraints [37], so this movement is legal. If the modifier and the noun are moved together as a whole, the varied form of separable words are formed. The modifier and the noun are merged, and so the NP is generated. Why could the head of the NP be moved? We propose that the modifier+noun structure is not complete because of the clitic attribute of the noun. We argue the clitic element prefers head

movement, rather than modifier movement. So the original form of the head incorporation is generated.

Chinese

$[_{VP} V (zhu+yi_i) [_{NP} Adjunct (dian'er) [NP t_i]]]$

There is another kind of stranding structure, for example,

Chinese

(41) a. *Dan xin ta*

concern he

'Be concerned about him'

b. *Dan ta de xin*

concern he possessor concern

'be concerned about him'

c. *Wei ta dan xin*

for he concern

'be concerned about him'

d. *Zhu yi ziji de yanxing*

pay attention self possessor words-and-behavior

'pay attention to one's words and behavior'

In these structures, the original separable form can be followed by some objects (41a, 41d). Or the objects can also be inserted between the two words of separable words (41b). (41c) is the varied form of (41a), in which the object is moved to the front of the separable words, and its case is assigned by a preposition. How are these structures generated?

In the lexical array, there are the verb morpheme *dan* and the noun morpheme *xin*, and the modifiers *ta*. The modifier and the noun merge to generate the NP *ta de xin* 'his worry'. This structure is identical with the structure *wo bang ta de mang* in (31). There is no belonging relationship between *ta* and *xin*, so there is the linker *de* to link the two elements. In the following process, *ta de xin* merges, as a whole, with the verb element *dan* to generate the varied form *dan ta de xin*.

Chinese

a. $_{VP} [_V dan [_{NP} [ta de xin]]]$

b. $_{VP} [_V dan [_{NP} ta de xin]]$

If the head *xin* of the noun is extracted to merge with the verb element *dan* with head incorporation, then the original form of separable words of syntactic object *dan xin* would be generated. And the modifier *ta* is left behind, and the whole structure would be the original form + object *dan xin ta*. In this process, the *de*, being just a linker between the modifier and the noun, disappears as there is no elements to link with.

The question is that in example (41), the VP *dan xin* can be followed by an object *ta* 'he', in contrast, the VP *bang mang* 'help' cannot. The structure *bang mang ta* is illegal. We argue that, different from *bang mang*, the original form can be divided into transitive and intransitive verbs. In *bang mang*, the thematic role of *bang* is satisfied with the object *mang*, and there is no need for an extra object. This is intransitive as a whole. While, in structures like *dan xin*, the *dan* is transitive, and the noun *xin* is intention or accusative. *ta* following *xin* is the dative case of the intention. In structure (41d) *zhu yi*, the *zhu* is transitive, and the noun *yi* is intention or accusative. *ziji de yanxing* following *yi* is the dative case

of the intention. The accusative role of *zhu* or *dan* is satisfied respectively by *yi* or *xin* respectively, but it can also be followed by a dative case. In contrast, *bang* could not assign a dative case. Therefore the whole structure *zhu yi* or *dan xin* can be followed by an indirect object, a dative element. According to the superiority of thematic role, accusative role is prior to dative role. So, the accusative element gets merged first, then the dative element gets merged later.

In another context, the dative element can be assigned a case by a preposition, such as,

Chinese

(43) *Wei ta dan xin.*

For he concern

'Be concerned about him'

In this structure, the case of *ta* is assigned by the preposition *wei* 'for'. This is to emphasize the dative element.

In the structures above, *de* disappears in the movement process. Wang [26] points out different scholars hold different perspectives on the syntactic status of *de*. In this article, we follow the argument of Huang et al [31], that *de* is a word without any value except for [N] [V] [F], and is just a morpheme linker to link the modifier and modifiee. When the possessor of noun gets moved, there is no necessity to link between the modifier and modifiee. So *de* disappears in the movement process. This perspective is in accordance with the NP phase argument.

5. Conclusion

Separable words can be combined or separated with some elements inserted between the two elements. The first element is usually a verb, and the second element is usually a clitic noun element. This clitic feature contributes to the different forms of separable words. The elements inserted can be the aspect markers of a verb, or it can be the modifiers of a noun such as adjectives, quantifiers, classifiers, or possessors. With the analysis above, we argue that separable words are not words or phrases, and they are a unique structure in language evolution. This structure is similar to the noun incorporation structure in other languages. The phrasal movement theory about noun incorporation can be applied to the combined/separated status of separable words in Mandarin Chinese. We draw the conclusion that Chinese separable words are generated in syntactic level with the phrasal movement. Different noun structures merge with V or v through head movement or phrasal movement, to generate the separable words. This can account for the different positions of the modifiers before the noun or after the noun. Our analysis is limited to the representative verb+object separable words, and there are other structures to be analyzed for further research.

In summary, compared with other analysis, the noun incorporation analysis provides a better analysis for the Mandarin Chinese separable words.

Abbreviations

AP	Adjective Phrase
AspectP	Aspect Phrase
ConjunctP	Conjunction Phrase
ClP	Classifier Phrase
CP	Complementizer Phrase
FocusP	Focus Phrase
dP	d Phrase
DP	Determiner Phrase
KP	K Phrase
LIH	Lexical Integrity Hypothesis
nP	n Phrase
NP	Nominal Phrase
PF	Phonological Form
TP	Tense Phrase
UTAH	Uniformity of Theta-assignment Hypothesis
vP	v Phrase
VP	Verb Phrase

Author Contributions

Shilong Wang is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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