A Cartographic Analysis of *hai* in Chinese

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Abstract: Under the framework of syntactic cartography, a new branch of generative grammar, this paper uses the methodology of Split Light Verb Hypothesis to analyze the cartography of *hai* in Chinese. *hai* has the original meaning of "to hurt" or " to damage" and it is followed by a patient NP. Later on in the history, *hai* can be followed a verb, an adjective or a NP that is not a patient of *hai*. Combined with the linguistic data from Mandarin Chinese and Chinese dialect, we classify *hai* into three types based on their semantic meaning: DO-type *hai*, BE-type *hai* (phrasal level) and BE-type *hai* (lexical level). Based on the comparison of BE-type *hai* (phrasal level) and BE-type *hai* (lexical level), this study supports the Lexicalist Assumption (Chomsky 1970): words are formed in the lexicon and their internal configurations are not subject to syntactic rules.

Keywords: *hai*, Split Light Verb Hypothesis, syntactic cartography, phrasal level, lexical level

1. Introduction

Syntactic cartography(Rizzi 1997；Cinque 1999；Rizzi & Cinque 2008；Si 2018, etc.) is a new research approach in the framework of Generative Grammar. Linguists following the cartographic approach try to "draw maps as precise and detailed as possible of syntactic configurations (Rizzi 1997)". The theory of light verb is another hot issue in the framework of Generative Grammar. The phenomenon is first detected by Jesperson (1949) and further discussed in Larson (1988), Hale& Keyser (1993, 2002), Chomsky (1995), Huang (1997), etc. Larson (1988) uses this idea in the analysis of double object construction. Halle & Keyser (1993) adopt this method in their analysis of verbalized nouns like *shelve (the books)* and *box (the apples)*. Following the cartographic principle, Si (2018) proposes a Split Light Verb Hypothesis with an attempt to split the light verb layer on the syntactic tree. The present paper will follow the cartographic approach and the Split Light Verb Hypothesis to draw the syntactic map for Chinese *hai*. Through the description of *hai*, this paper intends to provide an explanation for the syntactic distribution of *hai* in Chinese.

Huang (2015) states that Chinese *da (*beat*)* in *dayu* (fish) is a typical light verb and this proposal is widely recognized now. But there is not much research on other light verbs in Chinese since many linguists are confused by the definition, syntactic distribution of light verb. However, as Chinese has experienced numerous changes in the long history, many Chinese words are subject to grammaticalisation, especially verbs. In the process of grammaticalisation, the semantic content of some verbs become empty but their syntactic status is still significant. This kind of verb behaves like a light verb. Sometimes, a verb can both function as a content verb and a light verb (a grammaticalised verb) synchronically, among which Chinese *hai* is an

example.

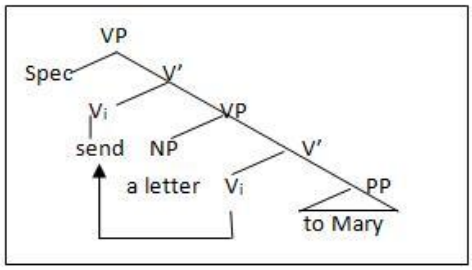
Originally, hai is a transitive verb and it means “to hurt”, taking a patient noun as its object. But in Mandarin Chinese and some Northern Chinese dialect such as Qingdao dialect, *Hai* can be followed by non-patient nouns, verbs or adjective. This kind of construction is rare in Mandarin Chinese, with *haibing*, *haixiu* and *haisao* as the typical examples. But it is really productive in Chinese dialect. In Qingdao Dialect, there are many words of the construction *hai*+ V or *Hai*+Adj. A study of the etymology of *hai* shows that *hai* has experienced grammaticalisation in its historical development. In the construction *hai*+V and *hai*+Adj, hai is semantically and syntactically empty.

The present study tries to draw the syntactic maps for Chinese *hai* under the framework of syntactic cartography. This paper is organized as follows. The next section is a review of previous research on light verb. The third section is dedicated to the theoretical framework of this study, including syntactic cartography and Split Light Verb Hypothesis. The fourth section presents the etymology of *hai* and previous study on the semantic classification of *hai*. Moreover, based on the Lexical Decomposition approach, we provide a semantic reanalysis and reclassification of the semantics of *hai*. The following section is a cartographic analysis of three types of *hai*. The last section compares BE-type *hai* (phrasal level) and BE-type *hai* (lexical level) and the comparison provides evidence for the Lexicalism proposed in Chomsky (1970).

2. Light Verb

The research on light verb can be dated back to Jespersen (1949). Jespersen (1949) finds that in some English phrases, the verb is grammaticalized and the semantic focus moves to the following nouns. For example, in the phrase *have a rest*, the verb *have* may have a little semantic content in itself, but it is the noun *rest* that provides the most part of the semantic content for the whole phrase. Nouns in these phrases express the meaning of an action or activity. The analysis of Jespersen (1949) is mainly based on semantic content, with little semantic consideration on the syntactic structures.

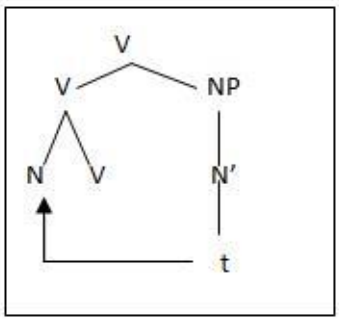
Larson (1988) applies this idea to the analysis of double object construction, such as *John sent a letter to Mary*. He names this construction as VP shell structure. According to his analysis, a double object construction consists of two layers: the lower layer is a VP: *a letter send to Mary* and it is an inner small clause; the upper layer is also a VP, which is formed by *send* moving up to its head position. The VP shell structure is illustrated in (1).



(1)

Larson (1988) provides a fine explanation for double object construction with the VP shell structure. The relation between deep structure and surface structure is well dealt with in this study and the binary branching structure is maintained at the same time.

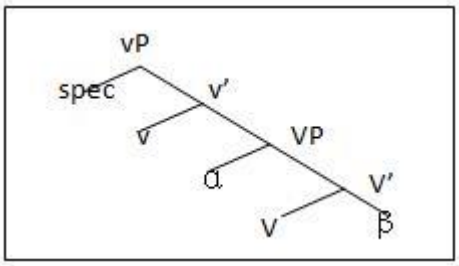
Hale& Keyser (1993) aims to testify the syntactical nature of lexical relational grammar. This study uses the term Lexical Relational Structure to indicate the relation between a verb and the arguments. The derivational process of a unergative verb from a noun to a verb is analyzed, for example the derivation from *laugh* as an intransitive verb to a noun as in *give a laugh*. The following syntactic tree in (2) shows the derivational process.



(2)

Hale& Keyser (1993) also makes an analysis concerning the derivational process of verbs such as *shelve (the books), box (the apples)*. They propose that verbs like shelve merge with an empty spatial preposition and then merge with an empty verb which expresses the meaning of placement. Finally, they merge with a light verb and result in a compound verb. Thus the compound verb can express at the same time the meaning of space, placement and causation.

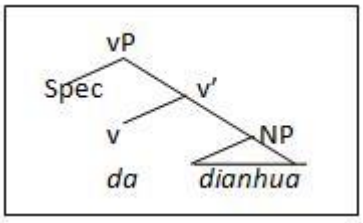
Chomsky (1995) adopts the previous analysis of Larson, Hale& Keyser and so no and uses the term light verb (marked as a small v) to refer to this phenomenon. He introduces this notion into the Minimalist Program and depicts the transitive structure as a structure containing an unpronounced light verb construction as in (3).



(3)

Chomsky's analysis of light verbs indicates that even the simplest transitive structure contain light verb structures. That is to say, light verb structures can be applied to the analysis of almost all types of sentences. This lead to numerous analysis of various possible light verb structures.

Under the background of Generative Semantics, Event Semantics and Lexical Decomposition, Huang (1997) proposes that light verbs are actually event predicates. Each verb has an event structure, embedded in event predicates, as the complement of light verbs. For example, the verb "cry" is embedded in the complement position of DO, and "fat" is embedded in the complement position of OCCUR. This type of light verb is called Huang's light verbs in Si (2018). Their complements can be pure nouns such as *da dianhua* (make a phone call). The light verbs in Huang's term are semantically empty, but their syntactic functions are almost the same as those of common auxiliary verbs.



(4)

3. Theoretical Framework

The main theoretical frameworks adopted in this study are Syntactic Cartography (Rizzi 1997, Cinque 1999, Cinque& Rizzi 2008, Si 2018, etc.) and Split Light Verb Hypothesis.

3.1.Syntactic Cartography

Linguists following the cartographic approach assume that the distribution of syntactic constituents on the syntactic trees are regular (Si, 2018) and thus they try to draw maps as detailed as possible of syntactic configurations, disentangling invariants and variable properties. (Rizzi, 2018) Some principles should be abided by when drawing maps for syntactic structures, among which the most important one is Local Simplicity (Rizzi, 2004):

Local Simplicity:

a. Simple phrase: binary branching
   no adjunction
   single complement
   single specifier
b. Simple heads: a head has single specification for each formal feature type

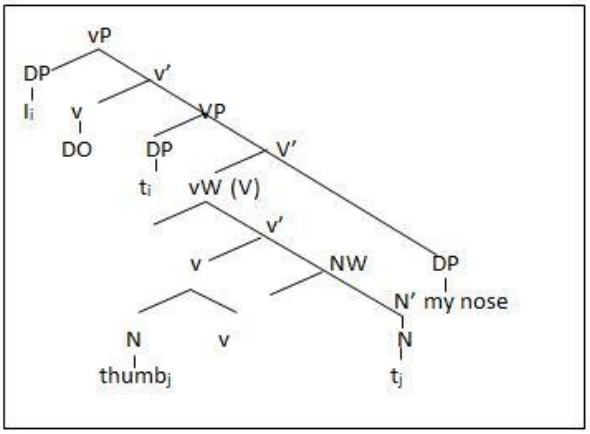
To satisfy the principle of Local Simplicity, each zone of traditional syntactic trees is split into finer components with rich functional sequences. (Rizzi, 2018) Under the cartographic framework, more and more linguistic researchers pay attention to language phenomenon on a micro level. For example, the layers of CP and TP were single projections previously, but now they are decomposed into structures with finer inner structures. The CP layer is split into Topic and Focus layers, which can be further decomposed. Depictions of left periphery can be found in Cinque (1999), Rizzi (1997) and so on.

Chinese is a perfect language to be studied under the framework of syntactic cartography, because Chinese functional elements visibly spread throughout projections and the external merge configurations in Chinese remain largely intact. (Huang 2015, Tsai 2015, recited from Rizzi 2018) These properties of Chinese offer an access to the fine structural configurations of clauses and phrases. (Rizzi, 2018) Therefore, the present study is conducted under the framework of cartography and is designed to offer a better description and better explanation for the distribution of Chinese *hai*.

3.2.Split Light Verb Hypothesis

Against the background of Cartography, Si (2018) proposes the Split Light Verb Hypothesis. This hypothesis assumes that the light verb layer can be further split into a light verb zone or a light verb field with a finer inner structure. The light verb zone is divided into an upper circle and a lower circle. Each circle contains an external light verb and an internal light verb.

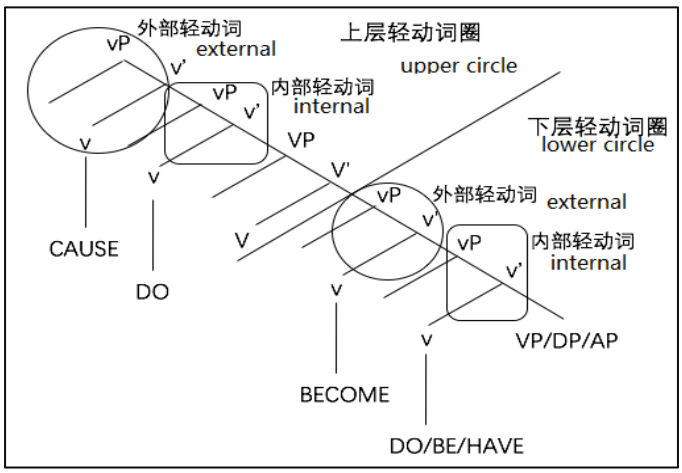
Another two related hypothesis are put forward in Si (2018): Argument Structure Chain Hypothesis and Event Fragmentation Chain Hypothesis. The Argument Structure Chain Hypothesis holds that every predicate component in a sentence has its own argument structure, including the predicate-based noun. For instance, the light verb structure of “I thumbed my nose” is demonstrated in (5).



(5)

The Event Fragmentation Chain Hypothesis assumes that each verb will form a shell structure, in which each has its own light verbs, including an internal light verb and an

external light verb. The two shell structures can be connected semantically and they together express a complete event or proposition. The model of such a light verb field is: […[vPEx CAUSE [vPInt DO [VP/ AP [vPEx BECOME [vPInt DO/ HAVE/ BE [VP/ AP]]]]]]]. The simplified version is illustrated as follows (this illustration is recited from Gong (2018), which is adopted from Si (2018)).



(6)

This analyzing method of light verb meets the requirement of Local Simplicity despite its seeming complexity. Compared with a one layer light verb zone, the Light Verb Split analysis comes much closer to Explanatory Adequacy.

4. The Cartographic Analysis of *Hai*

4.1.The Etymology of *hai*

Hai first appeared in the Bronze Inscription of the Western Zhou Dynasty. Its original meaning is “to cut off the tongue of the witness in order to extinguish the confession or testimony”. However, seal inscriptions mistakenly decompose the tongue shape of the upper part of the inscription *hai* into the shape of the cover and the vertical and horizontal cutting 丰, which leads to the disappearance of the original meaning clue and the extension of meaning of “kill or harm”. So it can be said that the original meaning of the word *hai* we see now is “to injure or damage”. In Analytical Dictionary of Characters (*Shuo Wen Jie Zi*), it is said that *hai* means “to harm” or “to hurt”.

Later on in the history, the word class of *hai* was extended. It can be used as a noun, such as in sentence (1). *Hai* in this sentence means “harms”.

(1) Bi xing tianxia zhi li, chuqu tianxia zhi hai. (cf. Mo-tse: In Universal Love)
Must flourish world ZHI benefits, remove world ZHI harm
Benefits of the world must be flourished, and harms of the world must be

removed.

It was not until the Five Dynasties or the Yuan, Ming, Qing Dynasties, that *hai* can be followed by non-patient nouns, verbs and adjectives. (Fu, 2017) Moreover, *hai* can be still used as a verb and means “to harm” or “to hurt”.
The etymology of *hai* reveals that it has gone through the process of grammaticalisation though its original use as a transitive verb still retains.

4.2.The Semantic Classification of *hai*

Combined the analysis on *Xiandai Hanyu Babai Ci* (Eight Hundred Words in Modern Chinese) and *Xiandai Hanyu Cidian* (The Contemporary Chinese Dictionary), it can be concluded that *hai* has six types of meaning: disaster; harm; to hurt; to kill; to get ill and to be in bad emotions. The first two types of meaning are expressed by *hai* functioning as a noun and the last four types of meaning are expressed by the verb *hai*.

When hai expresses “disaster” or “harm”, it is usually used in word formation, such as:

(2) Women yao fangzhi chong hai.
We need prevent insects damage
We need to prevent damages by insects.
(3) Women yiding yao wei ming chu hai. (*Xiandai Hanyu Babai Ci*)
We must need for people remove harm
We must do away with harm for the people.

Hai can be used to mean “harmful”, but it still functions as a noun.

(4) Zhexie nongyao dui youxie haichong wuxiao.
These pesticides for some harmful insects ineffective
These pesticides are ineffective against some pests.

When functioning as a verb, *hai* expresses four types of meaning. First, it means “to hurt” or “to do harmful things to”, as in (5).

(5) Zhangsan hai le Lisi.
Zhangsan hurt PER Lisi.
Zhangsan has hurt Lisi.

Hai can also be used in the V-de structure:

(6) Zhangsan hai de Lisi bude an’ning
Zhangsan make DE Lisi uneasy

Zhangsan made Lisi uneasy.

Second, hai means “to kill” in (7):

(7) Ta bei daitu hai le.
She PASSIVE gangster kill PER
She was killed by a gangster.

Third, *hai* means “to get ill” and must be followed by a noun object.

(8) Ta zheng hai zhe bing.
He PROG suffer PROG illness
He is suffering from illness.

At last, hai means “have negative emotions” in (9).

(9) Haipa
Be afraid

Hai of the last type of meaning must be followed by a verb or an adjective. In fact, the constructions made up by this kind of *hai* are rare in Mandarin Chinese, but abundant in certain Chinese dialect such as Qingdao dialect, which can be viewed as the remanence of ancient Chinese. The following examples are taken from Fu(2017).

(10) *Hai*+ adjective:
Haiyang (have the feeling of itching), haike (have the feeling of thirsty), haie (have the feeling of starvation), etc.

(11) *Hai*+ verb:
Haixiang (have the feeling of missing), haiqi (have the feeling of anger), haichou (have the feeling of anxiousness), etc.

This type of hai is classified as BE-type *hai* (lexical level) in the present study.

The semantic description of *hai* in *Xiandai Hanyu Babai Ci* (Eight Hundred Words in Modern Chinese) and *Xiandai Hanyu Cidian* (The Contemporary Chinese Dictionary) is not satisfying because such an analysis cannot reveal the connection between the different types of meanings. Therefore, the present study proposes a reanalysis of the semantic meaning of *hai*, based on the Lexical Decomposition Approach (Hale & Keyser 1993, 2002; Huang 2010)

We reclassify *hai* into three types: DO-type *hai*, BE-type *hai* (phrasal level) and BE-type *hai* (lexical level). DO-type *hai* is a two place predicate (transitive verb). It is semantically and syntactically real and it selects an agent and a patient. For example, in sentence (10), *Zhangsan* is the agent and *Lisi* is the patient.

(12) Zhangsan hai le Lisi.
Zhangsan hurt PER Lisi.
Zhangsan has hurt Lisi.

BE-type *hai* (phrasal level) selcets two arguments as well, but the two arguments are not agent and patient in a logical sense. In sentence (13), Lisi has exerted no influence upon *yichang bing* (illness). Besides, the deletion of BE-type *hai* (phrasal level) from sentence (13) is ungrammatical. Hence BE-type *hai* (phrasal level) is semantically empty but syntactically real.

(13) Lisi hai le yicahng bing.
Lisi suffer PER one- CLASSIFIER illness
Lisi is suffering from the illness.

(14) *Lisi yichang bing.
Lisi one-CLASSIFIER illness

BE-type *hai* (lexical level) is both semantically empty and syntactically empty. The deletion of *hai* from the following sentence does not affect its meaning and its grammaticality.

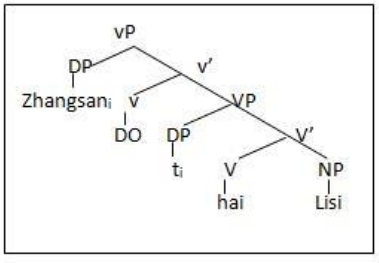
(15) Lisi haipa shandian.
Lisi fear lightning
Lisi is afraid of lightning

(16) Lisi pa shandian
Lisi fear lightning
Lisi is afraid of lightning

4.3.The Cartography of Three *hai*'s

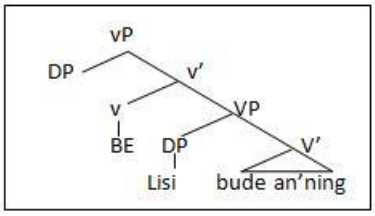
4.3.1. The Cartography of DO-type *hai*

According to Chomsky (1995), there exits light verb structure even in the simplest transitive constructions. Therefore, there exists a light verb DO above the two-place predicate. Hence the cartography of DO-type *hai* can be exemplified in (7).



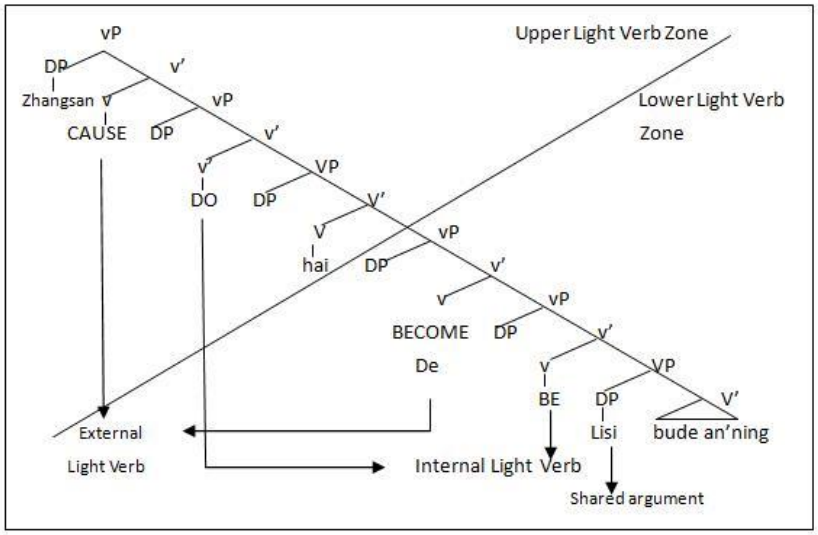
(7)

DO-type *hai* can also be used in V-*de* construction, as in sentence (6) above. The embedded sentence in (6) *Lisi bude an'ning* expresses a state, which is related to the light verb BE. The cartography of this embedded clause is (8).



(8)

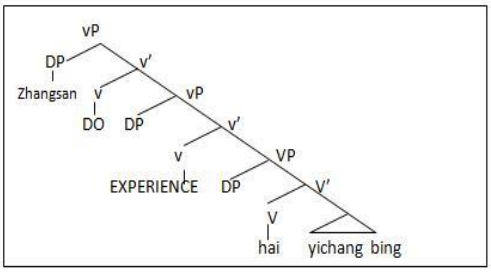
There are two event fragmentations in (6): "Zhangsan DO harm to Lisi" and "Lisi BE not peaceful". The light verbs belonging to these two events are DO and BE respectively and they are Inner Light Verbs. There are two External Light Verbs: CAUSE and BECOME. Xiong (2013) proposes that *de* in the V-de construction is the phonetic realization of the light verb BECOME. Since there are two events in sentence (6), another light verb CAUSE is needed in order to connect the two events. Tang (2011) states that CAUSE and BECOME are a pair of light verb to express the causal relationship. Therefore, the events in (6) are connected by two external light verbs CAUSE and BECOME. The two pairs of light verbs share an argument *Lisi*. The cartography of sentence (6) is demonstrated in (9).



(9)

4.3.2. The Cartography of BE-type *hai* (phrasal level)

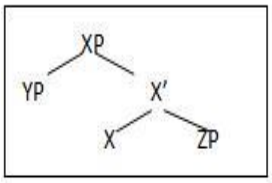
BE-type *hai* (phrasal level) is followed by non-patient nouns. It is similar to a typical Chinese light verb *da* (beat). In *dayu* (fish), *da dianhua* (make phone call), da has been detached from its original meaning of beating and gets close to the meaning of "make" or "do" in English. This is the same case for BE-type *hai* (phrasal level). The event denoted by BE-type *hai* (phrasal level) is "someone DO BE (or EXPERIENCE) something". The cartography of sentence (13) is as follows:

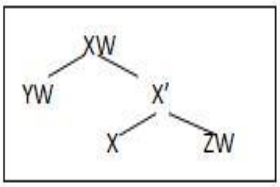


(10)

4.3.3. The Cartography of BE-type *hai* (lexical level)

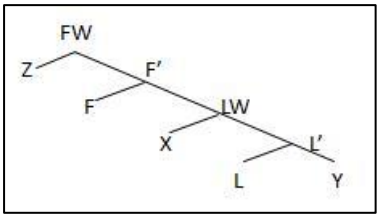
This section focuses on the cartography of BE-type *hai* at lexical level. Si (2011) discusses the hierarchical realization of pragmatic and semantic information in the phrase structure. Si (2012) proposes that the classical X' schema can be used not only to the structural analysis of phrases and sentences, but also to the analysis of word formation. The illustration (11) represents the X' schema at the phrasal level and (12) applies the schema to the lexical level analysis. (W for word)





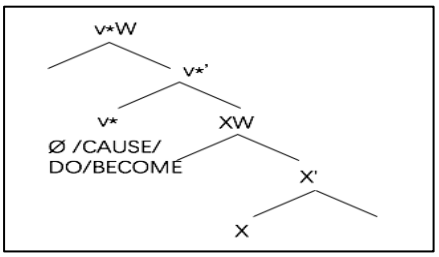
(11) (12)

Si (2014) further extends this hierarchy into lexical structure, marking functional category projection and lexical category projection in lexical structure with FW and LW respectively. The proposal is illustrated in (11).



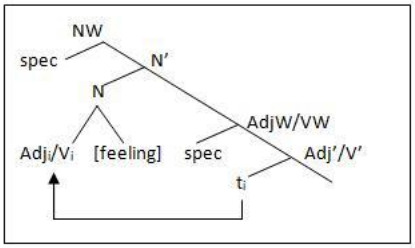
(13)

Based on the proposal of Si (2011, 2012, 2014), Gong (2018) proposes a Light Verb Morpheme Hypothesis (a preliminary version), assuming that a light verb morpheme projection v*W can be added to XW. Like light verbs at the syntactical level, v* is either semantically empty or expresses the most basic meaning such as CAUSE, DO or BECOME. It may have phonetic form or not. This proposal is shown in (14):



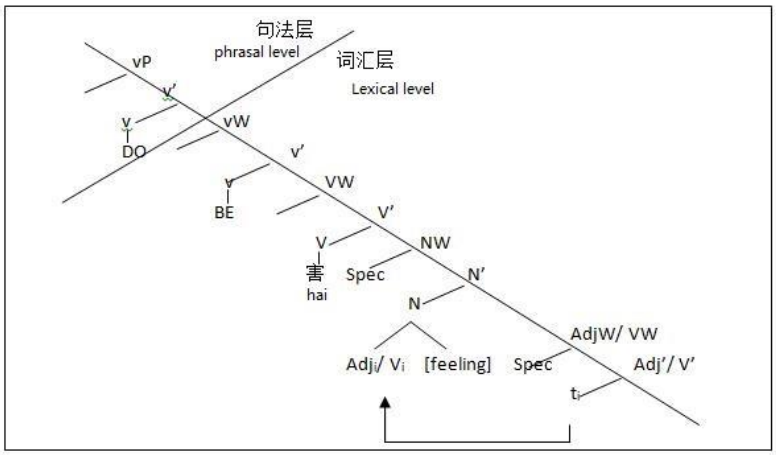
(14)

The assumptions above give inspiration for the cartographic analysis of BE-type *hai* (lexical level). The adjectives or verbs following *hai* express certain kinds of feeling. For example, *hai leng* means "experience the feeling of cold", *hai e* means "experience the feeling of hunger", etc. In this regard, this study holds that "*hai* + V / N" in Chinese is similar to "have a bad lie" in English, and the verbs and adjectives after *hai* have been transformed into nouns in the lexicon. (15) illustrates the syntactic performance of the adjective or verbs after *hai.*



(15)

The construction containing BE-type *hai* (lexical level) expresses "Someone BE (or EXPERIENCE) certain kind of feeling". The cartography is demonstrated as follows:



(16)

5. BE-type *hai* (phrasal level), BE-type *hai* (lexical level) and Lexicalism

A closer inspection of the cartography in (9) and (16) reveals that the structural

depiction of BE-type *hai* (phrasal level) and BE-type *hai* (lexical level) are almost the same, except that one is generated at the phrasal level and another is generated in lexicon. The question arises as for whether it is possible to cancel one level and then the two levels can be subject to the same rule system. There are two types of views concerning this question. Chomsky (1970), Lapointe (1980), Di Sciullo & William (1987) advocate the Lexicalist Assumption which emphasizes that each syntactic category has its autonomy and its own rules and the rules of each category do not interfere with one another. Words are formed in the lexicon and are not subject to syntactic rules. Phrase Structure Morphology (Sproat 1985; Walinska de Hackbeil 1986；Baker 1988) and Distributional Morphology (Halle & Marantz 1993, 1994; Harris 1998, etc.) insist that the lexical level does not exist. Phrases and words are operated by the same computational system. The present study holds that It is necessary to distinguish phrasal level and lexical level. The following comparison of the syntactic performances of BE-type *hai* (phrasal level) and BE-type *hai* (lexical level) attests to this assumption.

The construction made up of BE-type *hai* (phrasal level) permits the insertion of Chinese aspectual markers *le, zhe* and *guo* and number-classifier phrase like *yichang*.

(17) Hai guo bing
Suffer PER illness
Suffer from illness
(18) Hai le bing
(19) Hai zhe bing
(20) Hai yichang bing

On the contrary, the insertion of Chinese aspectual markers *le*, *zhe* and *guo* and the negative marker *bu* into constructions made up of BE-type *hai* (lexical level) leads to ungrammaticality.

(21) *hai guo xiu
Suffer PER embarrassment
Suffer from embarrassment
(22) *hai le xiu
(23) *hai zhe xiu
(24) *hai bu xiu

To sum up, both the phrasal level and the lexical level can be analyzed by the X' schema, and both have the light verb layer. However, the light verbs at the lexical level complete the word formation in the lexicon, while light verbs at phrasal level are subject to syntactic operations.

6. Conclusion

Under the framework of syntactic cartography (Rizzi 1997；Cinque 1999；

Cinque& Rizzi 2008), this paper makes an analysis of *hai* in Chinese. First, we classify hai into three types based on their semantic meaning: DO-type *hai*, BE-type *hai* (phrasal level) and BE-type *hai* (lexical level). Second, we adopt the Split Light Verb Hypothesis proposed by Si (2018) and the Light Verb Morpheme Hypothesis proposed by Gong (2018) and draw detailed syntactic maps for the three type of *hai*, which can provide an explanation for their different distributions. Third, based on the comparative study of BE-type *hai* (phrasal level) and BE-type *hai* (lexical level), this study supports the lexicalist hypothesis. The lexical hypothesis insists that words are formed in the lexicon and their internal configurations are not subject to syntactic rules. On the contrary, distributional morphologists and phrase structure morphologists assume that there is no lexical level. They insist that morphology belongs to syntax and all the operations are subject to one computational system. We propose that although the classical X' schema can be used to analyze the configuration of words, it is necessary to maintain the distinction of phrasal level and lexical level.

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