

A Generation Model for Clauses with Quasi-Attributives in Chinese: A Distributed Morphology-Based Approach

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Abstract. *As a special sentence pattern in Chinese, clauses with quasi-attributives have four major properties, namely, the mismatch between form and meaning, the ambiguity between quasi-attributives and real attributives, intrinsic link with verb-copying clauses, and the optional presence of “de”. Under the framework of Distributed Morphology, we propose that operations such as Feature Copying and Feature Introduction occurring on the PF branch may modify the structure generated by the syntax, introducing the apparent mismatch. This approach is not only effective in accounting for the properties of this sentence pattern, but also in line with ideas from the Minimalist Program, such as the lexical array, derivation by phase, etc.*

Keywords: ambiguity; distributed morphology; quasi-attributives; features; form-meaning mismatch

1. Introduction. Generally, clauses with quasi-attributives (CQA) refer to sentences like the following:

- 1) Ta-de laoshidang-de hao.
He-DE¹teacher be-DE² well
He teaches well.

This sentence is special in that: superficially, it is of the structure “attributive phrase (Ta-de laoshi/His teacher) + resulative verb phrase (dang-de/be) + adverb (hao /well)”, which naturally means “His teacher teaches well.” However, this is not the case, and its real reading is “He teaches well.” In this sense, CQA can be defined as a clause with a modifying phrase that is syntactically an attributive, but semantically a “subject +

¹Attributive marker in Chinese.

²Resultative marker in Chinese.

predicate” structure (See Zhu Dexi[[1]] for details).

As CQAs have neither been covered in NLP studies nor received satisfactory accounts in linguistic researches, we will try to draw insights from the theory of distributed morphology (DM), propose a solution to account for the features of this sentence pattern under a unified framework, and hope to offer some suggestions for the resolution of language ambiguities for NLP purpose.

The paper begins with an introduction of the major properties of CQAs, followed by a brief review of relevant studies to illustrate the various difficulties encountered in analyzing CQAs. Next, an analysis framework for CQA is proposed based on the theory of DM. Then this framework is put to test against CQA. It concludes with a summary of the proposed analysis.

2. Properties of CQAs. CQAs have four distinctive features. First, there is a mismatch between form and meaning. Though the “X-de Y” element in CQA shares the form of a possessive structure, it denotes the semantic relationship between subject and object. This mismatch between form and meaning is the most distinctive feature of CQAs and is closely related to its other features.

Second, there is ambiguity in the interpretation of CQAs. A “X-de Y” phrase can always be interpreted as either a quasi-attributive or a real attributive, as shown by the two readings in (2). We believe that the ambiguity results from the mismatch between form and meaning.

2) Ta-de toufa li-de hao.

He-DE hair cut-DE well

His hair is nicely cut.

(real attributive)

He is a barber, and does a good job. (quasi-attributive)

Third, there is an intrinsic link between CQAs and verb-copying structures. Generally speaking, CQAs are closely related to verb-copying clauses. The two structures are often interchangeable, as in:

3) a. Ta-de Zhouyu yan-de hao.

He-DE Zhouyu play-DE well

He plays the role of Zhouyu well.

b. Ta yan Zhouyu yan-de hao.

He play Zhouyu play-DE well

He plays the role of Zhouyu well.

However, it is necessary to point out that not all the verb-copying clauses can be converted to CQAs, taking (4) as an example.

4) a. Ta xihuan shuxue xihuan-de hen.

He like mathematics like-DE much

He likes mathematics very much

- b. *?Ta-de shuxue xihuan-de hen³.
 He-DE mathematics like-DE much
 *His mathematics likes very much.

Fourth, the attributive marker *de* is optional in CQAs. For certain structures, *de* is not obligatory. With *de*, (5a) is a CQA, and without *de*, (5b) is a focus structure (See [[2]] for details).

- 5) a. Ta-de lanqiu da-de hao.
 He-DE basketball play-DE well
 He plays basketball well.
 b. Ta lanqiu da-de hao.
 He basketball play-DE well
 He plays basketball well.

3. **Previous Studies.** Since Lü[[3] , [4]] and other related discussions on the CQA phenomenon, CQA has been extensively studied from the perspective of linguistics. According to the theoretical frameworks adopted, existing studies can be divided into those based on generative grammar and those based on cognitive theory, respectively represented by Huang’s “lexical decomposition and head movement” analysis [[5]]and Shen’s “analogical blending” analysis [[6]]. For limit of space, the present paper focuses on studies under the framework of generative grammar⁴.

3.1. **Related Studies and Discussion.** Huang (2008).Based on a critical review of the reanalysis approach to CQAs, Huang [[5]] proposes the “lexical decomposition⁵ and head movement” analysis, assuming the light verb theory⁶. Huang argues that *Ta-de laoshi dang-de hao* ‘He teaches well’ is derived as follows:

- 6) a. Ta DO⁷ ta-de dang laoshi (-de hao) (Deep Structure, DS)
 He DO he-DE doing teacher(-DE well)
 b. Ta dang_ita-de t_ilaosh (-de hao) (verbal head movement)
 c. [e] dang_i ta-de t_ilaoshi (-de hao) (subject-deletion)
 d. [Ta-de t_ilaoshi]_j dang t_j (-de hao) (object-fronting)
 e. Ta-de laoshidang-de hao. (Surface Structure, SS)
 He-DE teacher doing-DE well
 He teaches well.

³“*” means the sentence is unacceptable to native speakers, and “?” means a sentence is marginally acceptable.

⁴For analyses based on cognitive theory, please refer to [[2] , [6] , [7] , [8] , [9]].

⁵Lexical decomposition is based on the concept that, theoretically, a lexeme can be decomposed into two or more basic roots.

⁶A hypothesis in generative grammar that a verb phrase (VP) consists of the verb layer plus a layer hosting semantically light elements carrying such senses as *cause*.

⁷An abstract semantic element meaning *do, executing*, etc.

As shown above, in DS *ta-de dang laoshi* (his being a teacher) is a gerundive phrase, in which the quasi-attributive *ta-de* modifies *laoshi* (teacher) but the gerundive element *dang laoshi* (being a teacher). At the same time, the gerundive phrase is the object of the light verb *DO*, meaning that *ta zuo ta-de dang laoshi* (meaning something like *he carries out the event of being a teacher*). Being phonetically empty, *DO* requires the verb to adjoin to it to fill the surface vacancy. Thus, when the verb *dang* moves to *DO*, leaving a trace in the original position, we have *Ta dang_i ta-det_i laoshi (de hao)* (6b). After the deletion of the subject *ta*, there is an empty category “e” in (6c). Then, the gerundive structure *ta-de t_i laoshi* is fronted, deriving the surface structure of *Ta-de laoshi dang-de hao* (He teaches well), as shown in (6d, e).

Pan & Lu (2011). Pan et al [10] don't agree with Huang's criticism of the reanalysis approach, arguing that reanalysis is an indispensable operation in view of language development. They propose two analyses on CQA. One is based on verb-copying structure.

- | | |
|--------------------------------------|---|
| 7) a. Ta dang laoshi -de hao | (DS, SVOC)→ |
| b. Ta <u>dang laoshi</u> dang-de hao | (verb-copying structure: <u>SVOVC</u>) → |
| c. <u>Ta dang laoshi</u> dang-de hao | (reanalysis: <u>SVOVC</u>)→ |
| d. Ta-de dang laoshi dang-de hao | (nominalization: S- <u>deVOVC</u>)→ |
| e. Ta-de laoshidang-de hao | (verb-deletion: <u>S-deOVC</u>) |

In (7), reanalysis occurs between the subject and the first VP to form a small clause, *Ta dang laoshi*, followed by nominalization and verb-deletion. Along this line, *de* is the result of nominalization, and *de hao* behaves as the complement of the main verb *dang*. Insightfully, this analysis shows the intrinsic link between CQAs and verb-copying clauses. Though the verb is deleted in (7e), the resultant *ta-de laoshi* keeps the semantic structure of the original nominalization phrase, thus a CQA. A second analysis proposed by Pan et al is based on the focus structure, derived as follows:

- | | |
|--------------------------------|-----------------------|
| 8) a. Ta dang laoshi -de hao | (DS: SVOC) → |
| b. Ta laoshi [dang-de hao] | (reanalysis: SO[VC])→ |
| c. [Ta-de laoshi][dang-de hao] | (CQA: [S de O][VC]) |

The focus structure-based analysis shares the same DS with the verb-copying structure-based analysis. While in the second step, reanalysis occurs between the verb and its complement, forming a verbal phrase, *dang-de hao* (8b). Next, the subject *ta* merges with the object *laoshi*, followed by *de*-insertion, generating *ta-de laoshi*, and finally a CQA.

3.2. Discussion. Previous studies have explained the CQA phenomenon from different perspectives, providing us with better knowledge on related linguistic facts. Nonetheless, comprehensively speaking, these studies are insufficient both empirically and theoretically.

Empirically, none of them could fully explain the properties related to CQAs. Most studies discuss the four properties in an isolated way. We consider those properties crucial

to CQAs, and they should be dealt with under a unified framework.

Most existing studies are based on the *Government and Binding Theory* (GB) of generative grammar, which is incompatible with the most recent and widely adopted framework of *Minimalism*. The conceptual and empirical advantages of the *Minimalist Program* (MP) have already been extensively studied and proved effective since the early 1990s. As two core concepts in GB, DS and SS are eliminated as levels of representation in MP. Consequently, analyses referring to either DS or SS become theoretically unfeasible. Moreover, in accordance with economy considerations in linguistics, MP introduces concepts such as Lexical Array (LA), also called Numeration (Num). This concept, regrettably, is not ever mentioned in any of the reviewed studies. However, as we shall demonstrate in the following sections, it offers great insight in solving the puzzle of CQA.

4. The Framework. From the above discussion, it is clear that the introduction of *de* to form a CQA is neither a semantic nor a syntactic necessity. Given this fact, it is reasonable and natural to argue that the mismatch between form and meaning, and ultimately the ambiguity, is a result of morphological and phonological operations rather than syntactic operations. Next, we will try to propose a new analysis for CQA in line with ideas of MP, based on the theory of distributed morphology, especially the concepts of *Feature Copying* and *Feature Introduction* at the Phonological Form (PF) branch.

4.1. Distributed Morphology. DM [[11] , [12] , [13] , [14] , [15] , [16] , [17]] is fundamentally in line with MP, but holds a different view on the relation between syntax and morphology. The core claim of DM is the “Single Engine Hypothesis” which holds that a single generative system is responsible for both word formation and phrase derivation through basic operations such as Merge. In DM, there is no such a Lexicon that houses lexical items equipped with morphological, syntactic and semantic information. Instead, the grammar consists of three lists:

9) a. List one: the Syntactic Terminals, containing roots and abstract morphemes that feed syntactic operations.

b. List two: the Vocabulary, containing the list of vocabulary items providing phonological content to abstract morphemes, consulted at PF.

c. List three: the Encyclopedia, a repository of semantic information, i.e. the meanings of either roots or idioms, consulted after the output of PF/LF.

It is also necessary to specify the two types of syntactic terminals:

10) a. Abstract morphemes, also called functional morphemes, are features without phonetic forms, such as [Past] for past tense, [D] for determiners, etc.

b. Roots, also named lexical morphemes. They are combinations of sound and meaning without grammatical features, taking forms like √CAT, √SIT, etc.

For a derivation, abstract morphemes and roots needed to construct a clause are first drawn from the Syntactic Terminals List. The computational system then manipulates these terminals to derive a syntactic structure. At Spell-out (SO), the syntactic structure will be shipped to PF and LF respectively. On the branch of SO-to-PF, the computation system will consult the Vocabulary List to single out those vocabulary items that have the most features matching the node features and insert them into the structure produced by derivation. This operation is called Late Insertion. When the branches of PF and LF join again at the conceptual interface, the output is interpreted with the help of the Encyclopedia List. According to this way of derivation, morphological operations are distributed in two stages, the narrow syntax and the PF branch, thus giving the rise to the term *Distributed Morphology*[[15]]. The architecture of the grammar can be illustrated as in (See [[15]] for details):

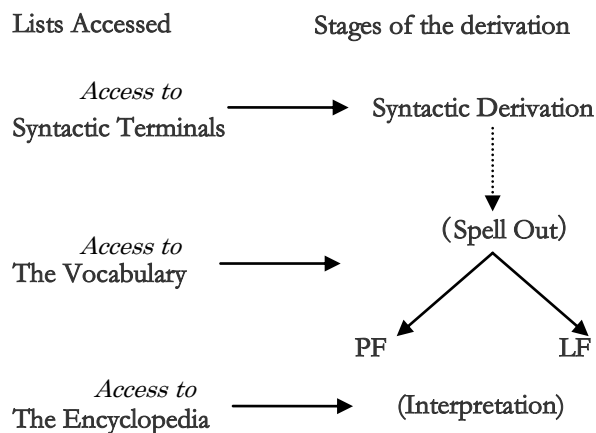


FIG. 1. THE DERIVATION PROCESS IN DM

Within the framework of DM, it is possible to adjust the structure derived in syntax in a limited way, through the operations of *Feature Copying* and *Feature Introduction* at the PF branch.

4.2. Feature Copying and Feature Introduction. It is pointed out by Embick & Noyer [[15]] that syntax generates hierarchical structures from a finite set of primitive elements, and the linear ordering of nodes in the resultant syntactic structure is possibly defined by operations at PF (cf. Chomsky[[18]]: 334 for related discussions). Such ornamental operations may include *Feature Copying* and *Feature Introduction* defined as follows:

- 11) a. *Feature Copying* (FC): a feature that is present on a node X in narrow syntax is copied onto another node Y at PF.
- b. *Feature Introduction* (FI): A feature that is not present in narrow syntax is added at PF⁸.

⁸ Only uninterpretable features that have no semantic effect could be introduced.

Feature Copying is more economic than *Feature Introduction* in that the former copies a feature that is already present in the structure while the latter adds a new one, a possible violation of the Inclusiveness Condition⁹, and should therefore be used with caution.

Since syntactic operations provide input to semantic interpretation, all the morphemes and interpretable features in a syntactic derivation are present at PF, but not all the morphemes and features present at PF come from syntax. Certain morphemes and features are newly introduced at PF according to language-specific phonological or morphological requirements. However, it must be emphasized that the operations at PF are performed after SO, not related to LF; the features added at this stage are syntactically and semantically unmotivated, rendering no semantic effects; and are just minimal readjustments on the derived syntactic structure. In other words, operations at PF such as *Feature Copying* and *Feature Introduction* modify the syntactic structure, but they actually do not affect the semantic interpretation of the original structure, thus introducing form-meaning mismatch and resulting in ambiguity.

4.3. Lexical Array and Derivation by Phase. As is discussed above, DM is fundamentally in agreement with MP, and the basic operation concerned is the same, i.e., Merge. As such, though our analysis is proposed under the framework of DM, it is also in line with ideas within MP such as lexical array and derivation by phase.

Lexical array, also called numeration, is the starting point of syntactic derivations and refers to the collection of lexical and functional items selected from the lexicon to be used up by a derivation. The computational system does not have direct access to the lexicon, but only to lexical arrays. The concept of lexical array not only makes it possible to eliminate the GB-based DS, but also enables a better formulation of the economy principle of UG. On the one hand, lexical array reduces the computational complexity of syntactic derivations, making derivations more economical. And on the other hand, lexical array provides a reference set for the comparison between two derivations, rendering the economy principle operational.

With the development of MP, lexical array is gradually replaced with lexical subarray which provides lexical items for phasal derivation. Phasal derivation means that the computation of syntactic structures proceeds phase by phase. It should be stressed that lexical array provides lexical items for phases, and lexical subarray provides lexical items for each phase.

4.4. Our Derivation Model. Assuming that morphemes and features can be introduced or copied at PF under the framework of DM, and adopting the concepts of lexical array and derivation by phase in MP, we propose a derivation model as follows:

⁹ The Inclusiveness Condition[[18], [19], [20]]:

No new features are introduced by C_{HL} . However, what is interesting is that Chomsky [[18]: 228] indicates that "...this condition holds (virtually) of the computation from N to LF...standard theories take it to be radically false for the computation to PF."

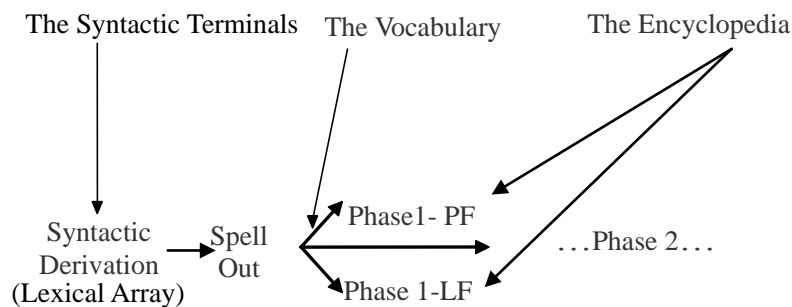


FIG. 2. A DERIVATION MODEL FOR CQAS

To generate a structure, the computation system first draws a collection of all the abstract morphemes and roots necessary for the derivation to compose a lexical array. Second, the computational system activates a subarray from the lexical array and builds phase1, using all the lexical items listed in the subarray. It then ships the complement of the head of phase1 to the PF and LF branches by spelling out. If the phase is converges at both LF and PF, the computation is allowed to proceed and the system activates a new subarray, repeating the previous procedures until a convergent structure is generated. To emphasize the key points here, when a phase has been derived and transferred to the PF branch, the computation consults the Vocabulary, providing appropriate phonological forms for structural nodes by late insertion. Meanwhile, the ordering of the phonologically realized forms is also defined. At this stage, if language-specific well-formedness conditions require a minimal modification on the syntactic structure through operations such as Feature Copying and Feature Introduction, mismatch between form and meaning is introduced because the operations at this stage is not related to LF. Finally, the output of PF and LF will be interpreted with knowledge input from the Encyclopedia.

5. Our Analysis.

5.1. **The Derivation of CQAs.** In view of the fact that CQAs feature a form-meaning mismatch, we put forward the following working hypothesis regarding the attributive marker *de*:

12) a. The *de* is not included in the original lexical array, but is introduced through *Feature Introduction* at PF.

b. CQAs, verb-copying sentences and focus sentences have identical lexical arrays, their differences resulting from the application of different operations at PF.

Next, we will try to demonstrate how our proposed model works with the following three sentences:

- 13) a. Ta-de toufa li-de hao (CQA)
He-DE haircut-DE well

His hair is nicely cut/ He is a barber, and does a good job.

b. Ta li toufa li-de hao (Verb-copying sentence)

He cut haircut-DE well

He is a barber, and does a good job.

c. Ta toufa li-de hao (focus sentence)

He hair cut-DE well

He is a barber, and does a good job.

These sentences are derived with the following steps. Step 1, the roots and abstract morphemes required for the derivation are drawn from the terminal list to form a lexical array:

LA = {ta, toufa, li, DE, hao, +v, +T, +C}¹⁰

Step 2, the elements required for phase one are taken from LA to form subarrayLA1:

LA1 = {ta, toufa, li, DE, hao, +v}

Step 3, generate a VP based on the verb *li*'s conceptual structure(See [[21]] for details):

14) [_{VP} [_{DP} toufa] [_{V'} [_V li] [_{RP} DE hao]]]

Step 4, generate phase one:

15) [_{VP} [_{Pron} ta] [_{v'} [_v [_{VP} [_{DP} toufa] [_{V'} [_v li] [_{RP} DE hao]]]]]]]

Step 5, transfer the derived structure (15) to LF and PF. During the transfer to PF, the vocabulary item list is accessed, and each element is assigned their phonetic information, ready for further operation(s).

Step 6, the derivation is presented with three options. Option 1, *Feature Introduction* is triggered to insert an attributive marker *de* between *ta* and *toufa*, resulting in a CQA:

16) [_{VP} [_{Pron} Ta] de [_{v'} [_v [_{VP} [_{DP} toufa] [_{V'} [_v li] [_{RP} DE hao]]]]]]]

Option 2, *Feature Copying* is triggered to copy the verb *li* to between *ta* and *toufa*, resulting in a verb-copying sentence:

17) [_{VP} [_{Pron} Ta] [_{v'} [_v li] [_{VP} [_{DP} toufa] [_{V'} [_v li] [_{RP} DE hao]]]]]]]



Option 3, no additional operation is performed, resulting in a focus sentence:

18) [_{VP} [_{Pron} Ta] [_{v'} [_v [_{VP} [_{DP} toufa] [_{V'} [_v li] [_{RP} DE hao]]]]]]]

Step 6, LA2 is drawn from LA:

LA2 = {+T, +C}

Phase two is generated and transferred to LF and PF, after which the encyclopedia list is accessed for semantic interpretation, thus ending the derivation with the three sentences in (13).

¹⁰Here, DE is the resultative marker, not the attributive marker.

- 19) [_{CP}C [_{TP}[_{Pron}Ta] de [_{T'}T [_{vP}[_{Pron}ta] [_{v'} [_v∅][_{VP} [_{DPT}oufa] [_{V'} [_vli] [_{RP}DE hao]]]]]]]]]]
- ↑
- 20) [_{CP}C [_{TP} [_{Pron}Ta] [_{T'}T [_{vP}[_{Pron}ta] [_{v'} [_vli][_{VP} [_{DPT}oufa] [_{V'} [_vli] [_{RP}DE hao]]]]]]]]]]
- ↑
- 21) [_{CP}C [_{TP} [_{Pron}Ta] [_{T'}T [_{vP} [_{Pron}ta] [_{v'} [_v∅][_{VP} [_{DPT}oufa] [_{V'} [_vli] [_{RP}DE hao]]]]]]]]]]
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5.2. Advantages of Our Account. In this section, we take a look at how well our theory account for the major properties of CQAs.

Now, the properties of CQAs will be explained. First, the form-meaning mismatch. The attributive marker *de* is introduced by FI at PF and inserted between *ta* and *toufa*. It should be noted that constituents introduced by FI at this stage are pure forms without any semantic content, affecting only the phonetic form. When the derived CQA structure in (18) arrives at the PF interface, the light verb *v* is pronounced as *de*, which is phonetically identical to the possessive and attributive marker *de* in Chinese, resulting in a superficial attributive structure *Ta de toufa*. But at LF, the *v* node is interpreted as a verb only. This is the cause of the mismatch between form and meaning.

Second, ambiguity. As for the true attributive reading of the sentence *Ta-de toufa li-dehao* (His hair is nicely cut), we believe that the *de* between *ta* and *toufa* is a possessive and attributive marker, and is included in the lexical array for the derivation. As for the quasi-attributive reading (He is a barber, and does a good job), the *de* is not in the lexical array, and instead is introduced into the structure by FI at PF. It can be seen that how the *de* is introduced into the derivation determines the distinction between the true attributive and quasi-attributive readings of CQAs. Apparently, this ambiguity is closely related to the form-meaning mismatch.

Third, the intrinsic link between CQAs and verb-copying sentences. According to our analysis, these two sentence patterns have identical lexical arrays. They result from different operations at PF. Specifically, verb-copying sentences result from FC, while CQAs are generated by FI.

Fourth, the non-obligatoriness of *de* in CQAs. The quasi-attributive marker *de* in CQAs is a pure morpheme without any semantic content; it is not included in LA, and instead it is introduced into the derivation at PF via the post-syntactic operation FI. And elements introduced by post-syntax operations are not required by syntax, but by Chinese-specific interface conditions at PF. It comes as no surprise that the *de* is optional in CQAs.

6. Conclusion. By drawing insights from the syntactic theory of *Minimalism* and the morphological theory of *Distributed Morphology*, we proposed a framework as the generation mechanism for a special sentence pattern in Chinese – clauses with quasi-attributives (CQA) – to account for its distinctive features in a unified way. It is shown that the attributive marker *de* in CQAs is not introduced into the derivation in narrow syntax, i.e., the syntax proper, but on the way from Spell-Out to the phonetic

interface, i.e., the PF stage, by the post-syntactic operation *Feature Introduction*. As morphemes introduced by post-syntactic operations do not carry any semantic weight and affect only the phonetic form of a derivation, there naturally arises a mismatch between (phonetic) form and meaning. We believe this mismatch is the root cause for the ambiguity observed in CQAs. In this way, all the features of CQAs are neatly justified.

As our discussion shows, superficially simple language structures can take on complex semantics which requires a solution taking into considerations factors at more than one linguistic level, four levels in the case of CQAs, namely, phonetic, morphological, syntactic, and semantic. It is hoped that such studies based on linguistic theories can shed some light on the resolution of language ambiguity, a tough but interesting topic in NLP.

REFERENCES

- [1] Zhu, Dexi. Lecture Notes on Grammar (语法讲义). The Commercial Press, Beijing (1982)
- [2] Wu, Huaicheng. On the Creation Mechanism of the Sentence Pattern “Para-attribute+ N + Vde R”(“准定语+N+V 得 R”句式的产生机制). *Language Science*. 2, 127-134 (2008)
- [3] Lü, Shuxiang. Notes about the Chinese Language (语文札记). *Studies of the Chinese Language*. 4, 287-292 (1965)
- [4] Lü, Shuxiang. *Ta-de Laoshi Jiao-de Hao* and *Ta-de Laoshi Dang-de Hao* (“他的老师教得好”和“他的老师当得好”). Notes about Language (语文杂记) (1984)
- [5] Huang, C.- T. James. On *Ta-de Laoshi Dang-de Hao* and Related Problems (从“他的老师当得好”谈起). *Language Science*. 3, 225-241 (2008)
- [6] Shen, Jiaxuan. On *Ta-de Laoshi Dang-de hao* and Related Constructions (也谈“他的老师当得好”及相关句式). *Contemporary Research in Modern Chinese*. 9, 1-12 (2009)
- [7] Huang, Guoying. Syntax and Semantic Functions of *De* (“的”的句法、语义功能). *The Study of Language*. 1, 101-129 (1982)
- [8] Shi, Jinsheng, Kuang Yan. The Formation Mechanism of the Sentence Pattern “*Ta-de Laoshi Dang-de hao*” (“他的老师当得好”句式的形成机制). *Chinese Language Learning*. 5, 28-37 (2010)
- [9] Shao, Jinmin. The Three Principles of Structure Reconstruction from the Perspective of Quasi- Attributes (从准定语看结构重组的三个原则). *Journal of Shanxi University (Philosophy & Social Science)*. 32(1), 62-66 (2009)
- [10] Pai, Haihua, Lu, Shuo. On the Necessity of Reanalysis: with Special Reference to the Construction “*Ta-de Laoshi Dang-de Hao*” in Mandarin (从“他的老师当得好”看句法中重新分析的必要性). *Studies in Language and Linguistics*. 31 (2), 32-40 (2011)
- [11] Embick, D. Features, Syntax and Categories in the Latin Perfect. *Linguistic Inquiry*. 31(2), 185–230 (2000)
- [12] Embick, D. Locality, Listedness, and Morphological Information. *StudiaLinguistica*. 57 (3), 143–169 (2003)
- [13] Embick, D. On the Structure of Resultative Participles in English. *Linguistic Inquiry*. 35 (3), 355–392 (2004)
- [14] Embick, D., Noyer, R. Movement Operations after Syntax. *Linguistic Inquiry*. 32 (4), 555–595 (2001)
- [15] Embick, D., Noyer, R. Distributed Morphology and the Syntax/Morphology Interface. In: Ramchand, G.,

- Reiss, C., (eds) *The Oxford Handbook of Linguistic Interfaces*, pp 289–324. Oxford University Press (2007)
- [16] Halle, M. *Distributed Morphology: Impoverishment and Fission*. *MIT Working Papers in Linguistics*, 30: 425–449 (1997)
- [17] Halle, M., Marantz, A. *Distributed Morphology and the Pieces of Inflection*. In: Hale, K., Keyser, S. (eds.) *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, pp 111–176. MIT Press, Cambridge, MA (1993)
- [18] Chomsky, N. *The Minimalist Program*. The MIT Press, Cambridge, Mass (1995)
- [19] Chomsky, N. *Minimalist Inquiries*. In: Martin et al. (eds). *Step by Step: Essays in Minimalist Syntax in Honor of Howard Lasnik*. The MIT Press, Cambridge, Mass (2000)
- [20] Chomsky, N. *Beyond Explanatory Adequacy*. Manuscript, MIT (2001)
- [21] Cheng, Gong. *Language Universals (语言共性论)*. Shanghai Foreign Language Education Press, Shanghai (1999)