The Syntactic Status of de and the Internal Structure of de Constructions in Chinese*

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This paper addresses some relevant explanations concerning *de* and *de* constructions in Chinese. Based on a detailed description of the main features of *de*, a novel analysis of the syntactic status of *de* and the internal structure of *de* constructions is proposed. It is argued that *de*, as a functional category, cannot be separated from the genitive constituent, and hence it cannot function as a head. In effect, the nature of *de* constructions is determined by the definite article, numerals or quantifiers and has nothing to do with de per se. *De* is a linking marker, which is used to connect the constituents preceding and following it, including the constituents with features of [+N] and [-V]. *De* can adjoin to the Spec or complement. As a consequence, in terms of structural segmentation, *de* should be segmented either with the Spec or with the complement, but it is only a clitic of the Spec or complement. Since de is not the head of *de* constructions, it cannot project as *De*P.

Key words: *de* construction; DP Hypothesis; head theory; functional category

1. Introduction

The focus of the paper is the expletive de in Chinese as in (1)-(2).

(1) Zhangsan de shu
    Zhangsan DE book
    Zhangsan's book
(2) zheben shu de chuban
    this-CLASS book DE publish[1]

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the publication of this book

De, which is the most frequently used word in Chinese, has been the focus of extensive research. Ever since Zhu (1961) was published, the research concerning *de* has never discontinued. Different scholars with different theoretical backgrounds have proposed different approaches, attempting to provide a complete and accurate explanation of the expletive. The academia has much dispute concerning the status of *de* and *de* constructions (Lu 1993; Lu 2003; Wu 2006; Ren 2008; Liu 2009). Thus, it has been analyzed in many different ways: as a C^0 or complementizer (Cheng 1986), as a D^0 (Simpson 2003), as the head of a ModP (Rubin 2003; Sio 2006), as a marker of predicate inversion having taken place (den Dikken and Singhapreecha 2004), as a semantic type-lowerer (Huang 2008), as the head of *De*P (Si 2004, 2006; Xiong 2005), as an NP modification marker (Ross 1983), or as any combination of these. Among these approaches to *de* and *de* constructions, Si (2004, 2006) and Xiong (2005) are worth noting because they arouse a new turn of discussions on *de* and *de* constructions in the circle of Chinese linguistics (Zhou 2005, 2006; Wu 2006; Tang 2006; Lu 2006; Yang 2008, 2010a, 2010b; Li 2008; Shi 2008; Chen 2009). The discussions on *de* and *de* constructions are in relation to the nature of *de* and *de* constructions. What is the syntactic status of *de*? What is the internal structure of *de* constructions? How should *de* constructions be analyzed? In order to solve these problems, this paper attempts to clarify some confusion found in the literature and to propose an alternative explanation under the framework of generative grammar. As a way to determine the syntactic status of *de*, the paper presents a novel analysis of the DP's criteria for the head, the syntactic status of functional categories as well as the syntactic status of *de*. The arguments concerning *de* actually differ from one another due to the way of segmentation of the

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1) Glosses used for the Chinese examples: CLASS = classifier, FEM=feminine, GEN= genitive, MASC= masculine, MOD= modal particle, NCL=numeral classifier, PL = plural, SG=singular, 1= first person, 3=third person, f=null constituent.

noun phrase containing *de*. In our alternative approach, functional categories can function as the syntactic head on condition that they can determine the phrase or clause's syntactic property, the category of their complements, and the agreement between gender, number, and Case. Furthermore, they must be syntactically self-sufficient. However, the expletive *de* cannot function as the head of the noun phrase containing it, for it does not have the features mentioned above. The conclusion is based on the head theory and DP hypothesis rather than linguistic instinct and counter-examples, which is different from Zhou (2005, 2006).[2]

The organization of the paper is as follows. Section 2 presents a criticism of some relevant explanations concerning *de* and *de* constructions. Section 3 focuses on the main features of *de*. Section 4 addresses the internal structure of *de* constructions.[3] Section 5 is the conclusion.

2. Some Relevant Explanations and Their Problems

Since there are too many previous analyses of *de* and *de* constructions, it is impossible to cover all of them in this paper. Therefore, I will only discuss some previous analyses that are relevant to motivate my own analysis of *de* in Chinese, with a focus on those

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2) Zhou (2005, 2006)'s argument is based on linguistic intuition and counter-examples. Hence it lacks systematic argumentation. In contrast, our argument is based on the head theory and DP Hypothesis. I argue that counter-examples cannot cancel the current theory. Only a better theory can replace it.

3) The main features of *de* in Chinese and the syntactic analysis of *de* constructions in Chinese are discussed in separate sections. First, the analysis of the first topic provides a sound basis for the analysis of the second topic. Second, such an arrangement contributes to a comprehensive and detailed analysis of de and *de* constructions in Chinese, which may avoid hasty generalization and oversimplication. It seems that the internal structure of *de* constructions in Chinese cannot be elaborated without a detailed description of the main features of *de*. Hence I disgree with an anoymous reviewer's statement that Section 3 and Section 4 are overlapping. I argue that the two sections focus on different aspects of de and de constructions. Section 3 focuses on the main features of de while Section 4 the internal structure of de constructions. To put it differently, the former focuses on the property of de per se whereas the latter focuses on the syntactic distribution and structure of de constructions. In Section 3, the inherent or lexical property of de is stressed whereas in Section 4, the structural or syntactic property of de constructions is stressed.

performed in the framework of generative grammar, including Si
(2004, 2006), Xiong (2005), and Shi (2008), which have sparked off an
intense debate on the syntactic status of *de* and *de* constructions in the
circle of Chinese grammar.

Si (2004, 2006) argues that *de* in Chinese is a functional head, the
feature of which facilitates the projection of *de* to *De*P. There is no
nominalization phenomenon in "N *de* V" structure, though the catego-
rical feature of the whole phrase is [+N]. The reason for it is that *de*
is a syntactic head, which bears the feature [+N]. According to the
head theory, the grammatical feature of the head determines the gram-
matical feature of the whole phrase (i.e. its maximal projection). Thus,
since *De* bears the categorical feature [+N] or [-V], *De*P bears the cate-
gorical feature [+N] or [-V], as shown in (3).

(3) a. [$_{DeP}$ YP [$_{De'}$ De de ZP]]
    b. [$_{DeP}$ YP zheben   shu [$_{De'}$ De de ZP chuban]]
       this-CLASS bookDE   publish

As (3b) shows, de is a C. It bears the categorical feature [+N] and
determines the feature of the CP headed by it. Though *chuban*
(publish) is a category with the feature [+V], the whole phrase *zheben
shu de chuban* is a category with the feature [+N]. In a word, the
categorical feature of the head determines the categorical feature of the
whole phrase headed by it. As a category with the feature [+N] or
[-V], *De*P's categorical feature is X. *De* is similar to [Z]x in the
exocentric construction.[4] Though it is an auxiliary, corresponding to
Z, its categorical feature is [+N] or [-V], corresponding to X, because
[Z]'s categorical or grammatical feature is X. Thus, [Z]'s categorical or
grammatical feature X determines the categorical or grammatical
feature of the whole phrase, and [Z] functions as the head of XP.
Similarly, *de* is the head of *De*P. In this way the head theory and the
endocentric construction theory are perfectly unified. Si (2004) argues

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4) The exocentric construction can be represented as XP→···YP ···+[Z]x while the endocen-
   tric construction can be represented as XP→···X ···.(Culicover and Nowak 2003:245-247)

that the head theory and the endocentric construction theory are similar in seeking for the criteria for the head because they both posit that the grammatical feature or function of the head determines the grammatical feature or function of the whole phrase headed by it.

Xiong (2005) argues that *de* can be a phonological realization of the functional category D, which causes the whole phrase to bear the nominal features. D takes an NP as its complement, and the functional category N in NP can make V/A bear the nominal features with syntactic dualism. D bears the strong EPP feature, and the feature triggers the partial movement in NP. Hence, the remaining element of NP is an argument, an adjunction or a lexical head, as illustrated in (4).

(4) a. [$_{DP}$ Spec [$_{D'}$ D de NP]]
    b. [$_{DP}$ Spec Zhangsan[$_{D'}$ D de NP shu]]
               Zhangsan   DE   book

As (4b) shows, *de shu* is a syntactic constituent. *De* is the head of *Zhangsan de shu*. Since *de* is a syntactic head, the *de* construction bears the categorical feature [+N]. Xiong (2005) argues that *hong de* (lit. red DE, i.e. red), *mutou de* (lit. wood DE, i.e. wooden), *chi de* (lit. eat De, i.e. food), and *ta mai de* (lit. he bought DE, i.e. what he bought) all have the categorical feature [+N].

Based on Si (2004, 2006) and Xiong (2005), Shi (2008) proposes that *de*, together with the constituents preceding and following it, should be regarded as an attributive, and that it is adjoined to the head. If the adjunct is analyzed as *De*P, the construction should be analyzed as (5).

(5) a. [$_{YP}$[$_{DeP}$ XP *De* de]YP]
    b. [$_{YP}$[$_{DeP}$ Zhangsan *De* de]YP shu]
       Zhangsan   DE   book

As (5) shows, if *de*, the constituent preceding *de*, and the constituent

following *de*, are regarded as a general *de* structure, the head of the whole *de* construction should not be *de* but Y of YP following *de*. As for the relation between de and the constituent preceding *de*, it is determined by syntactic function. XP, which precedes *de*, may occur in the form of NP, VP, AP, PP, and IP. These phrases do not function as syntactic objects when they merge with *de*, and they function as part of the attributive. In this sense, *de* plays a key role, for the whole attributive is *De*P headed by *de*. *De* is only the head of *De*P, which is the clitic of the whole *de* construction. Thus there is no immediate relation between *de* and the constituent following *de*.

Indeed, *de* is a functional word. Can it function as a head? Zhou (2005, 2006) argues that *de chuban* in the construction *zheben shu de chuban* is not consistent with the construction principle of Chinese grammar and hence has no psychological reality. He argues that it is a methodological mistake to treat *De*P in Chinese according to the head theory. Si (2004)'s treatment results in inconsistencies and mis-interpretations of data. Similarly, Xiong (2005)'s analysis of *Zhangsan de shu* in terms of the bracketing paradox is incorrect, and the data concerning this construction depart from the linguistic intuition he claims to have of *de* X. Zhou (2005, 2006) concludes that Xiong (2005)'s analysis is far from being convincing because the position of the syntactic constituent in the hierarchical structure is not necessarily related to its categorical function. In principle, there is no necessary connection between the functional word and the head. Whether the functional word can be a head is closely related to the theoretical need, viz. it is a theory-internal problem.

Regarding the functional word as a head, though methodologically possible, is subject to some constraints. In light of the Minimalist Program, functional words which represent grammatical function and lacks substantial meaning cannot be heads. Thus, Chomsky (1995), based on the minimalist ideas, argues that Agr's semantics is vacuous. In fact, it represents grammatical relation. Hence it cannot be a head. In terms of *de* in Chinese, it has no substantial meaning. It follows that *de* is not a head (cf. Tang 2006). In fact, *de* always occurs be-

tween the modifier and the head (cf. Ross 1984).

Shi (2008) is also faced up with the problem which Si (2004, 2006) and Xiong (2005) have met with in accounting for *de* constructions. Furthermore, he has more problems to solve. At first, Shi (2008)'s *De*P analysis must prove that *de* has the head status, and hence it can determine the syntactic property and internal structure of the phrase containing it. Nevertheless, *de* does not have such functions. Secondly, if the head Y is a V, it may conflict with its preceding *De*P, for *De*P requires that it be followed by an NP instead of a VP. If *de* is in the D position and hence causes the VP to have the feature [-V], the hypothesis of *De*P head status will be vacillated. Because *De*P is merely the maximal projection of *de*, which merely C-commands XP and *De*, and hence it contributes nothing to the head YP. Obviously, the category of YP cannot be determined by *De*P, and hence the category of YP does not match *De*P, which gives rise to an ungrammatical construction. Thirdly, *de* cannot determine the syntactic representation forms of its preceding and following constituents. In effect, it cannot determine whether these constituents occur overtly or covertly. Fourthly, *de* cannot be separated from the nouns which it is adjoined to and hence it cannot function as a syntactic head (Yang 2010a). Fifthly, *de* is not obligatory. To put it differently, it is not a category that has to be present. In fact, it may be omitted or deleted. Compare youya wuzi (lit. grace dance) and youya *de* wuzi (lit. graceful DE dance). Both of them are semantically identical, i.e. graceful dance. It follows that the presence or absence of *de* has no effect on the semantics of the phrase. Sixthly, *de* is not a category whose distribution is similar to that of the mother (cf. Hudson 1987). Seventhly, *de* does not stand in a relation of uniqueness to its mother or maximal projection. Eighthly, *de* is not always a daughter of the phrasal nodes onto which it projects the relevant categorical status. Though it can subcategorize for and govern its sisters, it cannot determine the actual categorical status of its sisters (cf. Hudson 1987; Hawkins 1995; Li 2008).

Furthermore, *De*P analysis may bring a series of consequences. If *de* is a head, the English genitive marker 's should also occupy the D po-

sition, as shown in (6).

   (6) a. [$_{DP}$ Spec$_i$ [$_{D'}$ D[NP t$_i$[$_{N'}$ N DP]]]]
      b. [$_{DP}$ John$_i$ [$_{D'}$'s[NP t$_i$[$_{N'}$ discussion of the paper]]]]

Along the lines of (6), John is generated in the position [Spec NP] and then moves to the position [Spec DP].[5] However, this analysis mechanism may bring a series of serious consequences. If 's can occupy the D position, the sentence "Whose book did you read?" should be analyzed as follows:

   (7) a.*[$_{DP}$ who[$_{D'}$'s book]]
      b.*[~~who~~ did +Q [you read [~~who~~ ['s book]]]]
      c.*who did you read's book?
      d.*whose did you read book?

The problem with (7a-c) cannot be feature checking. The strong wh-feature of Q is appropriately checked. In fact, (7a-c) violates the morphological requirements on the possessive suffix, which must attach to the genitive element. In other words, the genitive marker cannot function as the head of DP, as a result of which it cannot project as GenP (Genitive Phrase) on its own. Given this, one may wonder why the sentence in (7d) which would allow the possessive suffix to have its requirements satisfied is unacceptable. In effect, the problem with (7d) is that there is no licit syntactic derivation for it, because *whose* (=who's) is not a syntactic constituent, and hence it cannot undergo movement. In order to avoid the above problems, Hornstein *et al* (2005:305-307) propose that *who* which is the minimal projection containing the *wh*-feature should be moved and "Whose book did you read?" should be analyzed as follows:

   (8) [[who['s book]]$_i$ did+Q[you read[who['s book]]$_i$]]

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5) According to Ouhalla (1999:204-205), the subject in the position [Spec DP] receives genitive Case via Spec-head Agreement with D. The morpheme 's is the spellout of the genitive Case.

In (8) the whole object DP is moved to [Spec CP]. Therefore it is the only one that can satisfy all the relevant requirements. Firstly, the strong wh-feature of Q can be appropriately checked. The whole object DP moves to the position [Spec CP] in order to satisfy all the relevant requirements, i.e. Q's strong feature is properly checked. Secondly, the possessive suffix can be morphologically licensed. Thirdly, movement is operating with a syntactic object. Fourthly, the phrase "whose book", which is a minimal syntactic object, can allow all of these requirements to be satisfied in accordance with economy guidelines. However, this analysis mechanism cannot account for the grammaticality of the data in (9).

(9) a. Cuiam$_i$ amat Cicero [t$_i$ puellam]?   Latin
      whose loves Cicero   girl
      Whose girl does Cicero love?

   b. Čijeg$_i$ si video [t$_i$ oca]?   Serbo-Croatian
      whose are seen   father
      Whose father did you see?

As (9) shows, the left branch extraction applies here.[6] In order to account for the data in (9), Hornstein *et al* (2005:305-307) propose that the empty determiner genitive suffix can be separated from the genitive phrase as long as the wh-feature of the question specifier is checked. Given this assumption, overt movement of categories is understood to be that of formal features which is combined with pied-piping which is triggered by morpholocial requirements of the phonological constituent. Since only the material needed for convergence should be pied-piped, covert movement, which does not feed morphology, does not involve pied-piping.[7] In this case, English genitive con-

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6) The Left Branch Condition was proposed by Ross (1967), who noted the exceptional behavior of Russian and Latin which do not have covert determiners. This suggests that languages without determiners in general admit left branch extraction.

7) The asymmetry between overt and covert movement can further be supported by the following Brazilian Portuguese data.
  (i) a. Que fotografia *de* [si mesmo]$_{i/j}$[oJoão] disse que [oPedro]$_i$viu?
      which picture of self own   the João said that the Pedro saw
      Which picture of himself did João say that Pedro saw?
    b. [O João]$_j$ disse que [oPedro]$_i$ viu que fotografia *de* [simessmo]$_{i/*j}$?

structions and Latin and Serbo-Croatian genitive constructions are treated in different theoretical framework, which alleviates the explanatory power of the theory. Moreover, this analysis lacks psychological reality, for it is not identical to language facts.

In view of linguistic universalism, English genitive marker's and Chinese genitive marker *de* have the same syntactic function, and they all belong to the class of functional categories. Neither English genitive marker's nor Chinese genitive marker *de* can function as syntactic heads, for they cannot determine the features of gender, number, and Case. Nor can they be separated from the verb or noun which they adjoin to,[8] as a result of which they lack syntactic self-sufficiency

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the João said that the Pedro saw which picture of self own
Which picture of himself did João say that Pedro saw?

As (ia) shows, an anaphor that is embedded in the moved wh-phrase can co-refer with either the matrix or the embedded subject. In (ib), the anaphor can only co-refer with the embedded subject. If the relevant covert movement involves only formal features of the interrogative determiner *que* "that", then the anaphor *si mesmo* "selfown" can only have the embedded subject reading, as shown below (Hornstein *et al* 2005:307-308).

(ii) [[FF (que) +Q[o João]$_j$ disse que [oPedro]$_i$ viu que fotographia *de* [simeso]$_{i/*j}$]

8) This argument can further be supported by the following data.

(i) a. η a^{53} a^{31} mæ̈i^{53} Dulong (Huang 2007)   b. hau^{2}kə^3 mit^8 Lingao (Huang 2007)
     1SG 1SG-GEN mother   1SG-GEN knife
     my mother   my knife

   c. ţiu^1 tji^6 ti^{1}tsa: η   Dong (Huang 2007)   d. kə^5 di^2 dε ^{1} Cun (Huang 2007)
     1PL-GEN grandfather   1SG-GEN father
     our grandfather   my father

   e. i^{42} li^{33} ε ^{55} su^{33} Gelao (Huang 2007)   f. buku saja   Indonesian (Sha 1951:94)
     1SG-GEN sister-in-law   book 1SG-GEN
     my sister-in-law   my book

   g. kitaab-hu   Arabic (Ouhalla 1994:57)   h. ano hito   Japanese (Yang 2012)
     book 3SG-MASC-GEN   that-GEN person
     his book   that person

Similar to *de* in Chinese and 's in English, the genitive markers in (i) cannot be segmented from the constituents which they adjoin to. It is noteworthy that in such languages as Dulong, Lingao, Dong, Cun, and Gelao, the head noun precedes the possessor if no genitive marker occurs, as illustrated below.

(ii) a. mit^8 hau^2 Lingao (Huang 2007)   b. oη ^{1} ţiu^1 Dong (Huang 2007)
     knife 1SG   grandfather 1PL
     my knife   our grandfather

   c. sok^2 kə^5 Cun (Huang 2007)   d. mɔ^{21} i^{44} Gelao (Huang 2007)
     brother 1SG   mother 1SG
     my brother   my mother

Obiously, the occurrence of genitive markers has influence on the order of genitive constructions in Dulong, Lingao, Dong, Cun, and Gelao. Furthermore, gentive markers in Japanese have a distinctive function. Consider the following pairs.

(Yang 2008). According to the head theory, DP is characterized by self-sufficiency. To put it differently, it can function as subject or object on its own, and its form and meaning are complete. Compare (10) and (11).

(10) a. Fangfang-de meili xianeryijian
           Fangfang-GEN beauty obvious
           Fangfang's beauty is obvious.
     b. [DP' Fangfang-de[D' D meili]]xianeryijian.
     c.* [DPFangfang[D' *de* meili]]xianeryijian

(11) a. Fangfang's beauty is obvious.
     b. [DP Spec[D' Fangfang's beauty]] is obvious.
     c.* [DP Fangfang[D' 's beauty]] is obvious.

The above examples testify that *de*, like's, is not self-sufficient semantically and syntactically. It cannot function as subject or object on its own after being segmented. On the contrary, *de* and 's are self-sufficient semantically and syntactically if they cliticize to the preceding noun or pronoun, which suggests that this treatment satisfies both the requirement of syntax and the requirement of semantics. The above examples also testify that there exists correspondence between syntactic head and semantic head, for there is symmetrical projection between the syntactic system and the conceptual-semantic system, and the syntactic system always reflects the requirement of the conceptual-semantic system as much as possible. It follows that syntactic head is identical to semantic head, for only in this way can exact information be conveyed for the purpose of communication.9)

(iii) a. ano hito   b. are hito
         that-GEN person   that person
         that person
      c. kono hon   d. kore hon
         this-GEN book   this book
         this book

The genitive marker *no* is incorporated into the demonstratives. When the demonstratives serve the function of the arguments on their own, they occur in the form of *are* and *kore*, in which case no is not applied (cf. Yang 2012).

9) Following Simpson (2003), Saito *et al* (2008) claim that *de* is D and licenses N-bar deletion in Chinese, in contrast to Japanese *no* (a morphological linker), because it can neither follow a nominal adjunct nor co-occur with multiple arguments. I argue that this is not quite true. In effect, like *no* in Japanese, *de* can follow a nominal adjunct, as illustrated below.

(i) a. xiayu de rizi =yutian   a`.*yu de tian
    rain DE day   rain-day   rain DE day
    rainy day

  b. xiayu de jijie = yuji   b`.*yu de ji
    rain DE season rain-season   rain DE season
    rainy season

  c. mutou de xiangzi = muxiang   c`.*mu de xiang
    wood DE case   wood-case   wood DE case
    a wooden case

As (i) suggests, *yutian*, *yuji* and *muxiang* are words. They cannot be divided and hence *de* cannot be inserted into them. That is why *yu de tian*, *yu de ji*, and *mu de xiang* are ungrammatical. In contrast, *xiayu de rizi*, *xiayu de jijie* and *mutou de xiangzi* are phrases. Obviously *de* serves as an important marker that distinguishes between words and phrases which have different internal structures, as shown below.

(ii) a. [DP Spec [D` D[NP xiayu de rizi]]          a`.[NP yu-tian]
   b. [DP Spec [D` D[NP xiayu de jijie]]          b`.[NP yu-ji]
   c. [DP Spec [D` D[NP mutou de xiangzi]]          c`.[NP mu-xiang]

It noteworthy that the phrases that precede *de* are not in [Spec DP]. The contrast between (ii) and (iii) shows that *de* is in the Spec of DP or NP.

(iii) a. [DP Spec [D` nage[NP moutou de xiangzi]]
    a`. [DP Zhangsan de [D` nage[NP moutou de xiangzi]]
    b. [DP Spec [D` najian[NP hongmu de jiaju]]
    b`. [DP Zhangsan de [D` najian[NP hongmu de jiaju]]

Like *no* in Japanese, *de* can co-occur with multiple arguments, as illustrated below.

(iv) a. Zhangsan chuangzuo de nashou ge b. Zhangsan zhubian de naben cidian
    Zhangsan compose DE that-CLASS song   Zhangsan edit DE that-CLASS dictionary
    the song that Zhangsan composed   the dictionary that Zhangsn edited

  c. Waiyanshe chuban de zheben   d. Waiyanshe *zheben shu* de chuban
    FLTR publish DE this-CLASS book   FLTR this-CLASS book DE publish
    the book published by FLTR   FLTR's publication of this book

As (iv) shows, *de* can co-occur the external and internal arguments. The whole construction represents a structure with an agent being possessor, prepositional phrase being modifier and gerund being noun complement. Thus the ungrammaticality of *manzu de Luoma de huimie* and *Luoma de manzu de huimie* mentioned in Saito *et al* (2008) is due to the lack of prepositions. To put it differently, they can be grammatical if prepositons are inserted.

(v) a. ?manzu de dui Luoma de huimie   b. manzu dui Luoma de huimie
(vi) a. ?Luoma de bei manzu de huimie   b. Luoma bei manzu de huimie
(va) and (via) are not well-formed because *de* occurs more than once in an NP with multiple attributives. According to Yang (2010a, 2010b), *de* which is in the peripheral position tends be elided. Only the component with the property of agent and possessor can occupy the position [Spec DP].

Saito *et al* (2008) argue that if *de* is D and the phrase preceding *de* is in [Spec DP], the material following *de* can always be elided. This is so because the configuration for N`-ellipsis is satisfied, i.e. [DP XP [D` NP]]. I argue that this is partly true.

(vii) kaiche de = a. kaiche de ren   [CP *OP* (person) ti[Γ`I[VP kaiche]]]]

drive DE   drive DE person
　　　　　　　b.*kaiche de jishu   [CP *OP* (skill) i[IP ti[Iˋ I[VP kaiche]]]]
　　　　　　　drive DE skill

As (vii) shows, *kaiche de ren* is an appositive phrase with the structure "VP de t (i.e. transferred-designation) + N". Therefore, *kaiche de ren* can be replaced by *kaiche de*. In contrast, the structure of kaiche de jishu is "VP de s (i.e. self-designation) + N". As a consequence, kaichde de jishu cannot be replaced by *kaiche de*. The reason for the difference between the phrases is that in the structure "VP de t + N", there is potential SV or VO relation between V and N that co-refers with a null constituent in VP. In contrast, in the structure "VP de s + N", there is no potential SV or VO relation between V and N that does not co-refers with the null constituent in VP. Semantically, only *ren* can be the agent of *kaiche* while *jishu* cannot. In general, NP can be elided if it serves the function of agent and it can be preceded by a determiner.

(viii) kaiche de nage ren = kaiche de nage
　　　a. [DP kaiche de[Dˋ nage ren]]   b. [DP kaiche de[Dˋ nage ø]]
(ix) nage kaiche de ren = nage kaiche de
　　　a. [DP Spec[Dˋ nage kaiche de ren]]   b. [DP Spec[Dˋ nage kaiche de ø]]

It is self-evident that it is D that determines the occurrence or non-occurrence of NP and its position in DP. If "VP de NP" can be transformed into "NP+VP", then "VP de NP" can be reduced to "VP de", and vice versa.

Generally speaking, *de* not follow non-possessor attributives, such as nouns and distinguishers even when they are close to the head noun. It is noteworthy that connotation attributives (i.e. those that add lexical semantics to the noun) are followed by *de* (though not obligatorily), whereas extension attributives (i.e. those that mark the scope or range of the noun) cannot. It follows that the occurrence of *de* after attributives is not obligatory. According to Liu (2008), a numeral phrase with *de* is a descriptive attributive, as illustrated below.

(x) a. sanjin rou   b.*yikuai sanjin rou
　　　three-CLASS meat   one-CLASS three-CLASS meat
　　　three kilos of meat   Intended: a piece of meat of three kilos
　 c. sanjin de rou   d. yikuai sanjin de rou
　　　three-CLASS DE meat   one-CLASS three-CLASS DE meat
　　　meat of three kilos   a piece of meat of three kilos

A noun can be followed by only one numeral determiner. *Sanjin* is a numeral determiner and thus it cannot be followed by other numeral determiners. In contrast, *sanjin* de is a descriptive attributive and hence it can follow other numeral determiners. *De* does not follow individual classifiers because there is no semantic condition for them to serve as descriptive connotation attributives. If, however, the amount is large enough to represent subjective abundance, *de* can follow individual classifiers, which serve as descriptive attributives. As far as Japanese *no* is concerned, it serves as a marker of connotation attributives when it follows possessors and adjectives and serves as a marker of extension attributives when it follows classifiers and demonstratives.

(xi) a. neko no mimi   b. midori no hane
　　　cat NO ear   green NO plume
　 c. sam biki no neko   d. kono ho
　　　three CLASS NO cat   this-NO book

As (xi) shows, *no* which occurs in the determiner position, is an attributive marker. Last but not least, Saito *et al* (2008)'s approach to the Chinese noun phrase cannot account for the following data.

(xii) a. Zhangsan de na sanben shu   b. wo de zhe wupian wenzhang

To sum up, the approach *De*P is faced with the same challenge that they have to testify the reasonableness of this kind of structural form and they cannot account for the syntactic relation and semantic connotation which they represent. Most importantly, it is not in accordance with the constitution principle of Chinese grammar and lack mental reality.

3. The Main Features of *de* in Chinese

This section attempts to develop a new approach to *de* in Chinese by discussing its main features. It is generally believed that *de* is a functional word. Its features are as follows: 1) it is a closed category; 2) it is phonologically and morphologically dependent, because it is a bound morpheme which is pronounced in a soft voice; 3) it selects only one complement, which is not its argument; 4) it denotes grammatical relation.

As a functional word, *de* cannot determine the syntactic features of the phrase containing it. In fact, whether it occurs in the phrase cannot change the structural property or the grammaticality of the phrase. It does not behave like a head in regard to the characterization of phrase structures because there is neither de-phrase nor subcategorization requirement for a de-phrase. It does not project categorical features to create phrases headed by it. The category of the phrase projected is determined by the constituent merged with *de* and this constituent functions as the head of the phrase (cf. Li 2008; Yang 2008).

(12) a. Zhangsan *de* bucierbie

Zhangsan DE that three-CLASS book   1SG DE this five-CLASS article
the three books of Zhangsan's   the five articles of mine
    a`.?[DP Zhangsan[D de[CLP na san[CL` ben shu]]]]   b`.?[DP wo[D de[CLP zhe wu[CL` pian wenz-
                                                                                hang]]]]
Obviously de is not D. In fact, the demonstrative is D. Thus the above data should be
analyzed as follows.
(xiii) a. [DP Zhangsan de[D` na[NumP sanben[NP shu]]]]    b. [DP wo de[D` zhe[NumP
                                                                        wupian[NP   wenz-
                                                                        hang]]]]

Zhangsan DE leave-without-saying-goodbye

Zhangsan's leaving without saying goodbye

b. Zhangsan bucierbie

Zhangsan leave-without-saying-goodbye

Zhangsan left without saying goodbye

(13) a. Zhangsan *de* lengkuwuqing

Zhangsan DE cold-blooded

Zhangsan's cold-bloodedness

b. Zhangsan lengkuwuqing

Zhangsan cold-blooded

Zhangsan is cold-blooded

(14) Zhangsan *de* biaoyang

Zhangsan DE praise

Zhangsan's praise / Zhangsan praises (somebody)

As (12)-(14) show, *de* links the subject with the predicate/predicative and the attributive with the head noun as well as the verb with its object. However, the structural relation between the constituents does not change. The property of the constituents does not change either. *Zhangsan bucierbie* in (12a) can be seen as the result of deletion of *de*. Both *Zhangsan bucierbie* and *Zhangsan de bucierbie* are subject-predicate constructions. However, the former is a phrase whereas the latter is a sentence. (13a) is similar to (12a). (14) shows that *Zhangsan* may be the agent or patient of *biaoyang* (praise). In other words, *biaoyang* bears the feature [+N] or [-V]. Thus, *de* does not satisfy the prerequisite to the syntactic head.

Syntactically, *de* has no semantic selectiveness. It cannot determine the theta-role of its complement. As a bound morpheme, it cannot occur independently. Most importantly, it cannot determine the agreement between it and the verb. Similarly, it cannot determine the number of the constituents preceding and following it. In fact, it is the definite article or demonstrative pronoun that determines the number agreement between the constituents.

(15) a. ta de naben shu   b. ta de shu
    3SG-MASC DE that-CLASS book   3SG-MASC DE book
    that book of his   his book(s) / that book
                                       of his / those books of his

(16) a. ta de naxie shu   b. ta de shu
    3SG-MASC DE those book   3SG-MASC DE book
    those books of his   his book(s) / that book
                                       of his / those books of his

(17) a. wo nawei pengyou   b. wo de pengyou
    1SG that-CLASS friend   1SG DE friend
    that friend of mine   my friend(s) / that friend
                                       of mine / those friends
                                       of mine

(18) a. wo naxie pengyou   b. wo de pengyou
    1SG those friend   1SG DE friend
    those friends of mine   my friend(s) / that friend
                                       of mine / those friends
                                       of mine

As (15)-(18) show, it is the demonstrative pronoun na, together with the classifiers ben/xie/wei, that determines the number agreement between the constituents of the phrases. It bears the feature [+N]. Thus, the projection headed by it bears the feature [+N]. It takes NP as its complement. *De* only denotes ownership. It functions as a connector, connecting the preceding noun or pronoun with the following noun or verb (cf. Yang 2010a).

Furthermore, *de* cannot determine the Case of the constituents of the phrase, and hence it cannot determine the structural property of the phrase.

(19) a. xiuli qiche shi hen laolei de gongzuo[10]
    repair auto be very tiring DE work
    To repair autos is a very tiring work.

_____

10) The data in (19)-(21) are cited from Shi (2005).

b. qiche de xiuli shi hen laolei de gongzuo
auto DE repair be very tiring DE work
Auto repair is a very tiring work.

As (19) shows, the occurrence or non-occurrence of de has no influence on the grammaticality of the NP qiche xiuli. In fact, xiuli bears the feature [+N], which can be testified in (20) and (21).

(20) *a. zai yewai qiche xiuli shi hen laolei de gongzuo
　　　　 at outdoor auto repair be very tiring DE work
　　 *b. buduan　qiche xiuli　shi hen laolei de gongzuo
　　　　 continuous auto repair be very tiring DE work
　　 *c. buduan zai yewai qiche xiuli shi hen laolei de gongzuo
　　　　 continuous at outdoor auto repair be very tiring DE work

(21) a. buduan de qiche xiuli shi hen　laole de gongzuo
　　　　 continuous DE auto repair be very tiring DE work
　　　　 Continuous auto repair is a very tiring work.

　　 b. changqi　de qiche xiuli shi hen laolei de gongzuo
　　　　 long-term DE auto repair be very tiring DE work
　　　　 Long auto repair is a very tiring work.

　　 c. zai yewai changqi de qiche xiuli shi hen laolei de gongzuo
　　　　 at outdoor long-term DE auto repair be very tiring DE work
　　　　 Long auto repair outdoors is a very tiring work.

As (20) shows, *zai yewai* and *buduan*, which are predicattional adverbs, cannot co-occur with *xiuli*, which bears the feature [+N]. This suggests that *xiuli* can neither occur in the predication structure nor be modified by predicational adverbs or prepositional phrases. If, however, de is inserted between *zai yewai* and *xiuli*, the sentences will be acceptable, as illustrated in (21). The grammaticality of the sentences lies in the fact that the non-agent noun merges with the verb and functions as the subject. Furthermore, the feature [+N] of xiuli is determined by *qiche xiuliu*, not by *de*. *Qiche xiuli* can be extended to be *qiche de xiuli*, which shows that there is a null syntactic position,

which is occupied by the definite article. Hence it follows that qiche de *zhezhong xiuli* is grammatical. The reason lies in the fact that the definite article is the syntactic head, which determines the structural property of the whole phrase. Moreover, even if we decompose the above phrase, *zhezhong xiuli* still preserves its syntactic self- sufficiency. Consider the following data.

(22) a. [ta   de laifang] rang women gandao yiwai
         3SG-MASC DE visit   make 1PL   feel unexpected
         We were surprised at his visit.

   b. [ta   laifang] rang women gandao yiwai
         3SG-MASC visit   make 1PL   feel unexpected
         We were surprised at his visit.

   c. [ta   de turan laifang] rang women gandao yiwai
         3SG-MASC DE sudden visit make 1PL   feel unexpected
         We were surprised at his sudden visit.

   d. [ta   turan laifang] rang women gandao yiwai
         3SG-MASC sudden visit make 1PL   feel unexpected
         We were surprised at his sudden visit.

   e. [ta   de zheci turan laifang] rang women gandao yiwai
         3SG-MASC DE this-CLASS sudden visit make 1PL   feel unexpected
         We were surprised at this sudden visit of his.

   f. [ta   zheci   turan laifang] rang women gandao yiwai
         3SG-MASC this-CLASS sudden visit make 1PL feel unexpected
         We were surprised at this sudden visit of his.

(23) a. [wo guan   dianhan] yige   duo yue   le[11]
         1SG manage telephone one-CLASS more month MOD
         I have been in charge of the telephone for more than one month.

   b. *[wo de guan dianhuan] yige   duo yue le
          1SG DE manage telephone one-CLASS more month MOD

   c. [ta   biye] yijing si nian le
         3SG-MASC graduate already four year MOD

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11) The data in (23) are cited from Chu (2005).

　　　　It is four years since he graduated.
　d. *[ta　　　de biye]　　yijing　si　nian le
　　　　3SG-MASC DE graduate already four year MOD
　e. [ni　zai luoshan gongzuo] dou jiu nian le
　　　2SG at Luoshan work　　all nine year MOD
　　　You have worked at Luoshan for nine years.
　f. *[ni　de zai luoshan gongzuo] dou jiu nian le
　　　　2SG DE at Luoshan work　　all nine year MOD
　g. [ni　chumen]　　dou siwu　nian le
　　　2SG leave-home all four-five year MOD
　　　It is four or five years since you left home.
　h. *[ni de chumen]　　dou siwu　nian le
　　　　2SG DE leave-home all four-five year MOD
　i. [Zhangsan lai　Beijing] yijing　santian　le
　　　Zhangsan come Beijing already three-day MOD
　　　It is three days since Zhangsan got to Beijing.
　j. *[Zhangsan de lai　Beijing] yijing　santian　le
　　　　Zhangsan DE come Beijing already three-day MOD

The data in (22)-(23) show that the occurrence or non-occurrence of *de* has no influence on the grammaticality of the sentences. If *de* is seen as a marker used to transform a sentence into a phrase and triggers the nominalization of the verb, as a consequence of which the sentence has its grammatical subject, how shall we account for the grammaticality of the sentences containing *de* in (22)? In these sentences, the verbs can be modified by adverbs, and the whole construction functions as the subject. To account for the grammaticality of these sentences, we have to assume that the clause functions as the subject. It follows that *de* does not occur in the sentences in (22) obligatorily. As (23) illustrates, however, the sentences containing *de* are not grammatical. According to the head theory, the clause, bearing the feature [+N], is the maximal projection of C, viz. CP. However, C is null. The verb can be modified by adverbs and demonstrative pronouns. If *de* is seen as the syntactic head, it must occur obligatorily. If it does not occur, its position should be able to

be occupied by other constituents, or it should be able to be replaced by other constituents, for words belonging to the same category have the same grammatical features and hence they occupy the same syntactic positions or they can replace each other. However, the sentences in (23) strongly expel *de*. Thus *de* does not satisfy the conditions for the syntactic head (cf. Yang 2008).

Furthermore, *de* cannot be separated from the noun which it adjoins to, as a result of which it cannot be self-sufficient syntactically and semantically. However, in the light of the head theory, the head phrase DP is self-sufficient syntactically and semantically, i.e. it can function as the subject or object on its own, and its form and meaning are complete. This proves that there is correspondence between the syntactic head and the semantic head because there is symmetrical mapping between the syntactic system and the semantic system. The syntactic system always attempts to reveal the requirement of the semantic system as authentically as possible, and the syntactic head and the semantic head are identical. Only in this way can information be communicated effectively. (cf. Yang 2008) According to Simpson (2002), *de* does not seem to have any *definiteness* value, this generally being taken to be a defining property of determiners. Secondly *de* may occur more than once in an NP/DP, whereas DPs are commonly taken to be associated with a single D position and hence a single occurrence of a determiner. Thirdly, *de* clearly can co-occur with demonstratives which are otherwise generally taken to instantiate and occur in D, suggesting that *de* itself is not in D but is rather an element of a different type. The position occupied by the demonstrative might also appear to be a fully regular determiner position initial in the DP, whereas *de* is never found to be DP-initial and always follows some other constituent. In fact, *de* only occurs when there is some other modifying element present. The determiners seem to be intrinsically bound up with restrictive modification, and this is indeed a primary function of the determiners – although they may also function as place-holders and display signs of definiteness concord, the connection to modification and predication would really seem to be very strong.

To sum up, *de* is a functional category, but it cannot be a syntactic

head, for it cannot determine the syntactic features of the phrase contain-
ing it, and it cannot be separated from the verb or noun which it is ad-
joined to, as a result of which it lacks syntactic and semantic
self-sufficiency.

4. The Syntactic Analysis of *de* Constructions in Chinese

This section attempts to provide a sound analysis of *de* constructions
in Chinese. As shown above, functional categories can function as the
syntactic head on condition that they can determine the phrase or clause's
syntactic property, the category of their complements, and the agreement
between gender, number, and Case. Furthermore, they must be syntacti-
cally and semantically self-sufficient. The expletive *de*, however, cannot
function as the head of the noun phrase containing it, for it does not
have the features mentioned above. Actually, *de* is only a linking marker.
It is used to link the preceding constituent with the following constituent.
The preceding constituent bears the feature [+N] and functions as the
agent, patient, or possessor while the following constituent bears the fea-
ture [-V] or [+N]. *De* is used to show the difference between the phrase
and the sentence and to mark the symmetry between them. It can adjoin
to the Spec or complement. Thus, in terms of structural segmentation,
de should be segmented together with the Spec or complement. In view
of syntactic distribution, *de* often functions as the adjoined constituent
of the Spec. It occurs behind the personal pronoun, proper name, or verb,
but it cannot follow the demonstrative pronoun, because the demonstra-
tive pronoun usually functions as the syntactic head and the genitive prop-
erty of *de* determines its being used as a clitic[12] following the personal
pronoun or proper name. It cannot occur behind the demonstrative pro-
noun to denote specificity.

De constructions can involve only a possessive noun/pronoun and a
head noun or more constituents, such as demonstratives, numeral classi-
fiers, and adjectives, etc. According to its constituents and word order,

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12) The syntax and PF of *de* will be discussed in detail below.

de constructions fall into five categories, as shown in (24).

 (24) a. genitive + head noun (Gen-NP)
   a`. wo de shu
    1SG DE book
    my book(s)
   b. genitive +determiner+head noun (Gen-D-NP)
   b`. wo de naben shu
    1SG DE that-CLASS book
    that book of mine
   c. genitive+determiner+numeral classifier+head noun (Gen-D-NCL-NP)[13]
   c`. wo de na wuben shu
    1SG DE that five-CLASS book
    the five books of mine
   d. genitive+preposition+determiner+head noun (Gen-P-D-NP)
   d`. wo dui zheben shu de dianping
    1SG to this-CLASS DE comment
    my comment on this book

Since de constructions are characteristic of reference property in various degrees, its internal structure cannot be determined only by its overt constituents. Hence in order to determine its internal structure, we must determine its reference property first.

 According to the reference of the nominal constituents, de constructions fall into four classes, i.e. specific, definite, general, and quantificational. The noun with the feature [+specific] refers to a specific object or set of objects that both the speaker and the listener can identify while the noun with the feature [+definite] refers to an object or set of objects that only the speaker can identify (Yang 2010b). Since (24d-f) have only [+specific] property, which does not need to be discussed, the reference property of (24a-c) will be discussed in detail below. Consider the data in (25) and (26).

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13) Numeral classifiers and adjectives can occur in the NCL position.

(25) a. wo de shu　　　　　　b. my book/books
　　　1SG DE book　　　　　　 my book(s)

(26) a. wo de na wuben shu　　b. the five books of mine
　　　1SG DE that five-CLASS book
　　　the five books of mine

In (25), wo de shu can denote "a certain book of mine", "several books of mine" or "all the books of mine". Hence it follows that Gen-NP has not only [+specific] property but also [+general] property. (26) denotes [+specific] and [+numeral] property only. It follows that (24a-c) have [+specific] or [+general] property, (24d) has [+specific] property, and (24e-f) have [+specific] and [+numeral] property.

According to Abney(1987), the structure of NP is DP. In view of reference property, de constructions fall into two categories, i.e. [+specific] and [-specific]. Based on this argument, the internal structure of various types of genitive constructions can be analyzed as [DP GenP[D` N]]. The linear position of genitives is related to its reference property. De precedes the head noun with no regard to its property. In other words, de is positioned in [Spec DP], and Spec bears the strong feature [+AGR]. Therefore, whether D occurs overtly or covertly, de precedes the head noun (Yang 2010b).

Different from Si (2004, 2006), Xiong (2005), and Shi (2008), I argue that de is not a head, for it contributes nothing to its semantic formation. In other words, it itself contains no semantic value, and hence it contributes nothing to a sentence in terms of semantics. According to Yang (2008), a functional category used as a head must have the following features:

(27) Criteria for Functional Categories as a Head
　　 a. It can determine the syntactic features of the sentence with it,
　　　　 i.e. [±N] or [±V].
　　 b. It can determine the types of categories of its complement.
　　 c. It can determine the agreement of gender, number, and Case
　　　　 between the internal constituents of the phrase in which it is.
　　 d. It has syntactic-semantic self-sufficiency.[14]

A constituent cannot be a head unless it is headed by a dependent or peripheral constituent which functions as a determiner or modifier. In this case the function of the head is to be determined or modified by the dependent or peripheral constituent. When de follows a noun or pronoun, there is no coordination or predication between the noun or pronoun and de. In fact, de is a grammatical suffix, and it is subordinate. It merges with the preceding noun or pronoun to form a determiner or modifier headed by the noun or pronoun. When it follows a predicative constituent to form a phrase, it is also subordinate. It merges with the preceding constituent to form a predicative modifier. In both cases, it is the modified constituent that functions as a head (Chen 2009). Since de does not have the features of a head, it cannot function as a syntactic head. Actually, de is merely a clitic adjoined to the Spec or complement[15]. It itself is not the head of the construction in which it is. Hence it cannot project as *De*P. Then, what is the syntactic status of *de*? I argue that de functions as a linking marker in the construction, joining different types of Specs or complements to the head. It can be adjoined to a noun, pronoun, verb, or adjective to represent such semantic-syntactic relation as possessiveness, agent-patient, modifier-head, subject-predicate, and verb-object.[16] Thus de

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14) Syntactic self-sufficiency is defined as follows:
   A constituent is syntactically self-sufficient iff it is has complete syntactic function and serves the function of a sentence constituent on its own.
   Semantic self-sufficiency is defined as follows:
   A constituent is semantically self-sufficient iff it is complete or adequate in terms of semantics.

15) *De* sometimes adjoins to the preceding Spec and other times adjoins to the following complement. In the former case, it follows the possessor. In the latter case, it follows the adjective modifier. To put it differently, when there is no adjective modifier in the construction, it adjoins to the preceding Spec. Otherwise, it adjoins to the following complement. If, however, more than one *de* occurs in the construction, the former adjoins to the Spec while the latter adjoins to the complement, as illustrated below.
   (i) a. wo de qunzi
        1SG DE skirt
        my skirt
      b. wo de natiao lanse de qunzi
        1SG DE that-CLASS blue-DE skirt
        that blue skirt of mine

16) There is correspondence between the syntactic head and the semantic head because of the symmetrical mapping between the syntactic system and the semantic system. The syntactic system tries to satisfy the requirement of the semantic system and hence the syntactic head is in consistence with the semantic head. In this way the demand of communication can be met (cf. Yang 2008). Given this, I argue that the segmentation

constructions should be analyzed as (28) (cf. Yang 2010a).

(28) a. [DP Spec-de[D' D   de-YP]][17]

    b.

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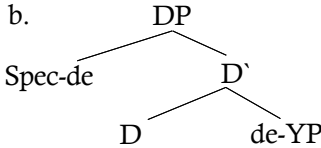
   of the noun phrase containing *de* must be syntactically and semantically sufficient.

17) Dai (2003:272) argues that *de* is a functional word representing relationship. It triggers movement. For this reason, *meili de guniang* is derived from (i). *Guniang* merges with *meili* to form TP, and de merges leftward with TP to form NP. Meili with the same feature moves to [Spec HP] to give rise to DP. In contrast, (ii) is base-generated. If the constituents in (ii) merge to form *youya wuzi* without *de*, *youya* cannot move. For this reason, the generated structure is a complete TP.

(i) a. [TP guniang[AP meili]]   b. [NP de [TP guniang[AP meili]]
      girl   beautiful   DE   beautiful   girl
   c. [NP meilii [NP de [TP guniang [AP ti]]]]   d.[DP D[NP meilii
     [NP de [TP guniang[AP ti]]]]]
   e.[DP zhege/sange [NP meilii [NP de [TP guniang[AP ti]]]]]
     this-CLASS/NCL beautiful DE   girl
     this beautiful girl / the three beautiful girls
(ii) [DP/NP youya[DP/NP wuzi]]
    graceful   dance

However, this analysis does not hold water. As mentioned above, *de* is a clitic. It cannot be separated from the noun or pronoun, which it adjoins to. Secondly, it does not have the feature [+N]. For this reason, it cannot project as NP. In fact, such cases of projection seem to be non-occurring. By comparing *youya wuzi* and *youya de wuzi*, we find that *de* is not the motivation to trigger movement, because the two constructions are semantically identical. In other words, the presence or absence of *de* has no effect on the semantics of the constructions. Moreover, Dai's analysis fails to account for more constructions with *de*, as illustrated below.

(iii) a. ?[TP shu[VP chuban]]   b. *[NP de [TP shu[VP chuban]]]
       book publish   DE   book publish
       publish a book
   c. *[NP chubani [NP de [TP shu[VP ti]]]]   d.*[DP D[NP chubani[NP de [TP shu[VP ti]]]]]
     publish   DE   book   publish   DE   book
   e.*[DP zheben [NP shui [NP de [TP chuban[VP ti]]]]]
     this-CLASS book   De   publish
(iv) a. ?[TP zhuozi[AP muzhi]]   b. *[NP de [TP zhuozi[AP muzhi]]]
       table   wooden   DE   table   wooden
  a wooden table
  c. *[NP muzhi [NP de [TP zhuozi[AP ti]]]]   d.*[DP D[NP muzhii [NP de [TP zhuozi[AP ti]]]]]
     wooden DE   table   wooden DE   table
  e.*[DP zhezhang [NP muzhii [NP de [TP zhuozi[AP ti]]]]]
     this-CLASS wooden   DE   table

(28a) is a bracket structure while (28b) is a tree diagram. In effect, they are structurally identical. As (28) shows, de is adjoined to the Spec or complement and it is part of the Spec or complement. The head is D, which takes the form of demonstratives[18]. The whole structure bears the feature [+N] or [-V], which is due to the existence of D, whether it is overt or covert. De can occur only in the Spec position or in the complement position or co-occur in the two positions. De can occur not only between nouns and pronouns but also between a verb and a noun, an adjective

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18) In *de* constructions, demonstratives serve the function of D, as illustrated below.
   (i) a. ta de lai
       3SG-MASC DE come
       his coming
       [$_{DP}$ Spec tade[$_{D'}$Df VP lai]]
    b. ta de zhezhong kuai
       3SG-MASC DE this-CLASS swift
       his such swiftness
       [$_{DP}$ Spec ta de[$_{D'}$ D zhezhong VP kuai]]
As (i) shows, only the demonstrative can occupy the position [D D']. If no demonstrative occurs in the *de* construction, there will be a null position in the underlying structure. In terms of semantics, the difference between (a) and (b) lies in the fact that the former expresses the general connotation of the act while the latter stresses the relative intensity of the act. Moreover, the demonstrative denotes specificity, as illustrated below.
 (ii) a. wo de pengyou
      1SG DE friend
      my friend
      [$_{DP}$ Spec wo de[$_{D'}$ D ↗ VP pengyou]]
    b. wo de nawei friend
      1SG DE that-CLASS friend
      that friend of mine
      [$_{DP}$ Spec wo de[$_{D'}$ D nawei VP pengyou]]
In (iia), there is no demonstrative in the *de* construction. The position [D D'] is empty and hence the phrase is semantically unspecific. In (iib), the demonstrative *nawei* occupies the position [D D']. The phrase is specific in terms of semantics. To put it differently, *de* is only a clitic which adjoins to the possessor or demonstrative, but only the demonstrative can occupy the position [$_D$ D']. This conclusion applies to English and German data.
(iii) a. his coming
      [$_{DP}$ Spec his[$_{D'}$ D ↗ VP coming]]
    b. his such swiftness
      [$_{DP}$ Spec his[$_{D'}$ D such NP swiftness]]
(iv) a. sein Kommen
      3SG-MASC come
      his coming
      [$_{DP}$ Spec sein[$_{D'}$ D ↗ VP Kommen]]
    b. sein solche Schnelligkeit
      3SG-MASC such swiftness
      [$_{DP}$ Spec sein[$_{D'}$ D solche NP Schnelligkeit]]

and a noun. In the light of Liu (2008), all connotation attributives in Chinese can contain de. Possessive constructions tend to be interpreted as being definite semantically, but they have no fixed reference, which can be determined by means of determiners, as shown in (29).

(29) a. wo de naben shu   (specific)
      1SG DE that-CLASS book
      that book of mine
   b. wo de yiben shu   (unspecific)
      1SG DE one-CLASS book
      a book of mine
   c. wo de shu   (classified)
      1SG DE book
      my book(s)

The occurrence of *de* in Chinese is related to its position. The closer it is to the specifier, the more possible it is to be omitted. In contrast, the closer it is to the noun complement, the less possible it is to be omitted. *De* can occur more than once in a construction. Possessive constructions are positioned in front of noun complements. Similarly, they are positioned in front of prepositional phrases. If prepositional phrases modify noun complements, a construction "genitive + prepositional phrase + noun complement" will be formed. Prepositional phrases are positioned in front of noun complements because noun complements are transformed from verbs. Thus the whole construction represents a structure with an agent being possessor, prepositional phrase being modifier and gerund being noun complement, as shown in (30).

(30) a. ta dui ta de piping
      3SG-MASC to 3SG-FEM DE criticize
      his criticism of her
   b. ta dui zheben shu de jingcai dianping
      3SG-MASC to this-CLASS book DE brilliant comment
      his brilliant comment on this book

Semantically and structurally, the demonstrative is closer to the noun complement while the possessive is farther from the noun complement. The demonstrative and definite article occupy the position of D, and hence they bear definite and specific information, as a result of which they determine the property and structural feature of the whole phrase. And the demonstrative is situated in the outer layer of the phrase structure, i.e. the Spec position.

(31) a. [DP Spec wo de [D' D naben NP shu]]
    b. [DP Spec Zhangsan de[D' D natiao NP piaoliang de qunzi]]
        Zhangsan DE   that-CLASS pretty   DE skirt
        that pretty skirt of Zhangsan

De is in the position [Spec DP] and it is higher than the two functional heads DP and NCL in terms of hierarchical structure. It is noteworthy that in Chinese DP can be higher than *de* if it is licensed by the preposition. To be exact, *de* follows DP, which can be seen as a component of DP.

(32) a.

```
              DP
          /        \
       Spec         D`
                 /      \
               D         NP
                         |
                        DP
                     /      \
                  Spec       D`
                           /    \
                         D       NP
```
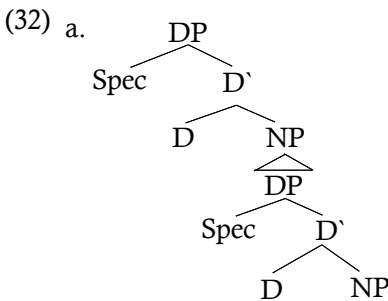
    b. [DP Spec[D' D[NP[DP youguan[D' Zhangsan de baodao]]]]][19)
                    concern   Zhangsan DE report
                    the report about Zhangsan
    c. [DP Spec[D' napian [NP[DP youguan[D' Zhangsan de baodao]]]]]
                    that-CLASS   concern   Zhangsan DE report

---

19) For the sake of limited space, the analysis of the data is shown in brackets.

that report about Zhangsan

d. [DP wo de[D' napian [NP[DP youguan[D' Zhangsan de baodao]]]]]
1SG DE that-CLASS   concern   Zhangsan DE report
that report of mine about Zhangsan

e. *[DP wo de[D' napian [NP Zhangsan dei [N' ti baodao]]]]
1SG DE that-CLASS Zhangsan DE   report

f. *[DP wo de[D' na[NumP sanpian[NP Zhangsan dei [N' ti baodao]]]]
1SG DE that three-CLASS Zhangsan DE report

g. *[DP GenP[D' napian[NP Spec[N' Zhangsan de baodao]]]]
that-CLASS Zhangsan DE report

(32e-g) are ungrammatical because genitives cannot occupy [Spec NP] or [D D`] and demonstratives cannot precede genitives and occupy [Spec DP]. There can be only one genitive before the head noun. If two or more genitives occur, the following genitive must function as the object of the preposition and modify the head noun. In other words, in Chinese double genitives are not allowed, and the genitives behind the first genitive must be licensed by the preposition. Obviously the analysis of preposition licensing can account for Chinese genitives.

Generally speaking, the constituents preceding and following functional categories have different thematic roles, such as agent, patient, theme, experiencer, instrumental, location, manner, and goal. Since the constituent preceding functional categories precedes the head linearly and occupies the Spec position, its thematic role is determined first. Once the thematic role of the constituent preceding functional categories is determined, the thematic roles of other constituents situated in the complement position are determined accordingly. In other words, the thematic role of the constituent preceding functional categories determines that of the constituent following functional categories. This shows that the thematic roles of the preceding and following constituents are determined unidirectionally. In this case phrase structure is similar to clause structure. Linear relation and thematic roles are determined by the head. To realize correspondence and symmetry between phrase structure and clause structure, especially to satisfy the requirement of interface between syntactic

structure and information structure, the head assigns agentive Case to
the preceding constituent and patientive Case to the following constituent
respectively. Since *de* is a genitive marker or linking marker, it always
adjoins to the Spec instead of the head. The thematic role of the con-
stituent in the complement position is determined by the Spec but not
by *de*, which can be testified by means of the following examples (cf.
Yang 2010a).

  (33) a. naxie diren de pohuai
           those enemy DE destroy
           the enemies' destruction
       b. nazuo chengshi de pohuai
           that-CALSS city DE destroy
           the destruction of the city
  (34) a. *pohuai de naxie diren
            destroy DE those enemy
       b. *pohuai de nazuo chengshi
           destroy DE that-CLASS city

(33) and (34) cannot be accounted for by means of *De*P analysis proposed
by Si (2004, 2006), Xiong (2005), and Shi (2008). Though *pohuai* de and
chengshi de are structurally identical, they cannot be analyzed as *De*P,
because this analysis departs from the linguistic intuition. For this reason,
(34) is ungrammatical. According to our analysis, *pohuai de diren* and
deren de pohuai are different. The difference between them is shown in
(35).

  (35) a. [$_{DP}$ Spec[$_{D'}$ D naxie NP diren de pohuai]]
       b. [$_{DP}$ Spec[$_{D'}$ D nazuo NP chengshi de pohuai]]
       c.*[$_{DP}$ Spec pohuai de[$_{D'}$ D naxie NP diren]]
       d.*[$_{DP}$ Spec pohuai de[$_{D'}$ D nazuo NP chengshi]]

As (35a-b) show, the determiners naxie and nazuo occupy the D position,
and NPs *diren de pohuai* and *chengshi de pohuai* occupy the complement
position. *De*, which functions as an attributive marker, modifies *pohuai*.

Hence the constructions are grammatical. As (35c-d) show, *pohuai de* occupies the Spec position, the determiners naxie and nazuo and NPs *diren* and *chengshi* occupy the D position and the complement position respectively. Since only genitive constructions are allowed to occur in front of the determiner, and *pohuai de* is not a genitive constituent but VP with an attributive marker, the constructions are ungrammatical. It is noteworthy that *pohuai* has the feature [-V] because of D, or rather, it has gerundized, and hence it can be modified by a noun or pronoun. This shows that the head determines the form of the complement. If the head is D, the complement can only be NP or VP with the feature [-V]. If VP occupies the Spec position, the construction is generally ungrammatical unless the VP has the feature [-V]. (cf. Yang 2010a)

(36) a. zaodao pohuai de nazuo chengshi
         suffer destroy DE that-CLASS city
         the city which has been destroyed
     b. [$_{DP}$ CP zaodao pohuai de[$_{D'}$ D nazuo NP chengshi]]
(37) a. *zaodao pohuai nazuo chengshi
         suffer destroy that-CLASS city
     b. [$_{DP}$ Spec zaodao pohuai[$_{D'}$ D nazuo NP chengshi]]
(38) a. nazuo chengshi zaodao pohuai
         that-CLASS city suffer destroy
         the city has been destroyed
     b. [$_{IP}$ Spec nazuo chengshi[$_{I'}$ I[$_{VP}$ V zaodao NP pohuai]]]

(36a) is generated from (38a) but not from (37a). In (36a), *zaodao pohuai de* is CP with the feature [-V, +N], which can occupy the Spec position, as shown in (36b). In (37a) *zaodao pohuai* is VP with the feature [+V], which cannot function as the Spec, and hence the construction is ungrammatical, as shown in (37b). Similarly, *zheben shu de chuban* is not derived from *zheben shu* chuban by means of de-insertion but from *chuban zheben shu*.

(39) a. [$_{DP}$ Spec zheben shu de [$_{D'}$ D NP chuban]]

this-CLASS book DE   publish

the publication of this book

b. [$_{VP}$ Spec[$_{VP}$ V chuban DP zheben shu]]

publish   this-CLASS book

publish this book

In other words, *chuban zheben shu* undergoes nominalization, in which *zheben shu* functions as the attributive of VP, which gives rise to GP (i.e. gerund phrase), i.e. *zheben shu de chuban*. The whole derivation is shown in (40).

(40) [$_{GP}$ Spec zheben shui de[$_{G'}$ G[$_{VP}$ V chuban t$_i$]]]

In (40) *zheben shu* moves from [NP VP] to [Spec GP] to satisfy the edge feature. Thus movement has nothing to do with Case. Edge feature requires that there be a constituent on the edge of the head and that there be a Spec which functions as subject of VP or attributive of NP. Argument movement takes place to satisfy the edge feature by filling the Spec of NP, which can be occupied by only one argument. Thus either agent or patient can occur in this position. Generally speaking, if the Spec is occupied by agent, patient can only function as the complement. In contrast, if the Spec is occupied by patient, agent must be omitted. It is noteworthy that GP is equal to a SV structure, the head of which bears the nominal feature [-V, +N] (Yang 2010a). In other words, GP can be regarded as IP/TP. It follows that when it is determined by a genitive determiner, a verb still retains its function of being modified by an adverb and constituting a yes-no question. The property of a head constrains the form of the modifier and the choice of the determiner. The verb can be determined by the genitive determiner, but not by the definite article, for the definite article is a determinative constituent. On the other hand, it has lost some verbal features. For this reason, the whole construction bears the nominal feature. Furthermore, such a phrase as *zheben shu de chuban* should be labeled as a nominal non-finite verb phrase because it has the determiner of a nominal phrase and its centre retains

some important features of a verb except that it is a non-finite one. (Chen 2009) In this way, the above problems, which Si (2004, 2006), Xiong (2005) and Shi (2008) are faced with, can be smoothly solved.

To sum up, *de* constructions are analyzed as [$_{DP}$Spec-de [$_{D'}$D de-YP]] where it is adjoined to the Spec or complement and it is part of the Spec or complement. The whole structure, due to the presence of D, bears the feature [+N] or [-V]. *De* is in the position [Spec DP] and it is higher than the two functional heads DP and NCL in terms of hierarchical structure. It is noteworthy that in Chinese DP can be higher than *de* if it is licensed by the preposition. To be exact, *de* follows DP, which can be seen as a component of DP.

5. Conclusion

In this article I have offered three contributions to the study of *de* and *de* constructions in Chinese. First, I have shown that *de*, as a functional category, cannot be separated from the genitive constituent and hence it does not function as a head.[20] In effect, the nature of *de* constructions is determined by the definite article, demonstratives, numerals or quantifiers and has nothing to do with *de* per se. Second, I have shown that *de* is a linking marker used to connect the constituents preceding and following it, including the constituents with features of [+N] and [-V]. It can adjoin to the Spec or complement. As a consequence, in terms of structural segmentation, *de* should be segmented either with the Spec or with the complement, but it is only a clitic of the Spec or complement, thus contradicting Si (2004, 2006), Xiong (2005) and Shi (2008)'s *De*P analyses. Third, I have given a comprehensive analysis of the internal structure of *de* constructions in Chinese. In this theory, *de* constructions are analyzed as [$_{DP}$ Spec-de [$_{D'}$D de-YP]] where it is adjoined to the Spec or complement and it is part of the Spec or complement. The head is

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20) An anonymous reviewer observes that in English syntax, the tense element/morpheme is not separated from a verb that carries it, but it is well-known to argue for/assume it to be separated from the verb in abstract syntax. In other words, it can project as TP. However, in Chinese, *de* cannot project as *De*P, which has been testified.

D, which takes the form of demonstratives. The whole structure bears the feature [+N] or [-V], which is due to the existence of D, whether it is overt or covert.

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