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A Probe-Goal Approach to Parametric Variation in English and Mandarin Chinese Nominal Phrases*

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This paper is a comparative study of the morphosyntax of the constituents referred as noun phrases (NPs) in traditional grammar, and it focuses on empirical data from English and Mandarin Chinese. This paper investigates the internal structure of nominal phrases in terms of Abney's (1987) Determiner Phrase (DP) Hypothesis, which proposes that nominal phrases are headed by determiners. Furthermore, it pursues a universal structure for the nominal phrase in all languages in line with Pereltsvaig's (2007) Universal-DP Hypothesis, which asserts that the syntactic structure of the nominal phrase is universal regardless of the presence of lexical items which realise the heads of the functional projections. More specifically, it proposes a Probe-Goal feature-valuing model to account for the parametric variation in these two languages within the framework of Chomsky's (2000, 2001, 2004) phase-based Minimalist Programme.

1. Introduction

This paper is a comparative study of the morphosyntax of the constituents referred as noun phrases (NPs) in traditional grammar. In particular, it will focus on empirical data from English and Mandarin Chinese. The phrase structure of nominals in these two languages has been investigated in the literature (i.e. Cheng and Sybesma (1999) on Mandarin and Cantonese, Li (1999) on English and Mandarin). This paper investigates the internal structure of nominal phrases in terms of Abney's (1987) Determiner Phrase (DP) Hypothesis, which proposes that nominal phrases are headed by determiners. Furthermore, it pursues a universal structure for the nominal phrase in all languages in line with Pereltsvaig's (2007) Universal-DP Hypothesis, which asserts that the syntactic structure of the nominal phrase is universal regardless of the presence of lexical items which realise the heads of the functional projections. More specifically, it will propose a Probe-Goal feature-valuing model to account for the parametric variation in these two languages within the framework of Chomsky's (2000, 2001, 2004) phase-based Minimalist Programme.

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The paper is organized as follows. In section 2, I present the parametric variation of nominal phrases in English and Mandarin Chinese. In Section 3, I briefly review the previous literature discussing the phenomena of the two languages. In section 4, I propose a unified-structure account, which is committed to the claim that the functional structure in the Narrow Syntax are uniform across all languages, in order to explain the parametric variation in the two languages. In section 5, I apply the proposed account to analyse the data presented in Section 2. Section 6 concludes the paper.

2. Nominal phrases in English and Mandarin Chinese

It is well-known that we can observe parametric variation in nominal phrases cross-linguistically as shown in (1) and (2):

(1) a. English: I hate **cats**/**the cats**.
b. Mandarin: Wo^{3} tao^{3}yan^{4} **mao^{1}**/**na^{4} zhi^{1} mao^{1}**.

(2) a. English: **Rice** is good to eat.
b. Mandarin: **Fan^{4}** hen^{3} hao^{3}chi^{1}.

In these two languages, nominal phrases behave quite differently in three respects: definiteness, gender, and number. In English, the definiteness is expressed by an article (i.e. *the* and *a*). Genericity is conveyed by bare plurals or mass nouns as in (1a) and (2a). There is no grammatical gender marker. The number is distinguished by the plural marker *-s* as in *the cat* versus *the cats*.

Mandarin is radically different from English. There are no articles such as *a* and *the*. Bare nouns appear in argument positions to express genericity as in (1c) and (2c). They can also express definiteness as in (3):

(3) **Gou**^{3} yao^{4} guo^{4} ma^{3}lu^{4}
dog want cross road
Singular reading: ‘The dog wants to cross the road.’
Plural reading: ‘The dogs want to cross the road.’
NOT: ‘A dog wants to cross the road’ or ‘Dogs want to cross the road.’

In the expression of quantities, the numeral classifier is required as shown in (4).

(4) shi^{2} *(**zhi^{1}**) bi^{3}
ten CL pen
‘ten pens’

In addition, although there is a plural marker[1] in Mandarin, it is quite restricted in use. The plural marker *-men* can only be used with nominals denoting human beings. This can be demonstrated by the contrast of grammaticality in (5).

(5) a. hai^{2}zi^{5}-men^{5}
child-MEN
'children'

b. *zhuo^{1}zi^{5}-men^{5}
table-MEN
Intended meaning: 'tables'

3. Literature Review

Following the description of parametric variation between the two languages, this section review the literature, addressing the issue of whether we can have a unified structure to analyse the data or whether we need a language-specific structure for each language.

In the literature, most authors adopt non-unified approaches to explain the differences within a language or among languages. For example, Cheng and Sybesma (1999) propose that Chinese and English have different encoding mechanisms for definiteness. According to their proposal, definiteness is encoded by the function head, Classifier (Cl), in Chinese whereas it is encoded by the D head in English. This is motivated by their assumption that the encoding of (in)definiteness in articled and article-less languages is fundamentally different. The two types of encoding strategies that they assume are schematised as below:

Sio's (2006: 29; modified):

(6) Articled languages such as English: [$_{DP}$ Definite [$_{NumeralP}$ Indefinite]]
Article-less languages such as Chinese: [$_{NumeralP}$ Indefinite [$_{ClP}$ Definite]]

According to their proposal, the DP in English and the ClP in Chinese are inherently definite, whereas the NumeralP in both languages is inherently indefinite. However, as noted by Chan (1999), it is not theoretically plausible for the Cl head and the Numeral head to have a fixed value of definiteness, namely the Cl head carrying a [+Definite] feature and the Numeral head carrying a [+Indefinite] feature as proposed by Cheng and Sybesma (1999). This proposal in turn will lead to a crash in the derivation of the nominal phrase, for the feature specification of a functional head is percolated to the highest node of an extended projection (Grimshaw 1991). Therefore, Cheng and Sybesma's (1999)

[1] As to whether the suffix *–men* is a plural marker or a collective marker, readers are referred to Iljic (1994, 2001) and Li (1999) for discussion.

postulation of inherently indefinite NumeralP containing the inherently definite ClP must be on the wrong track.

In order to account for the differences between English and Mandarin nominals, Li (1999) proposes a non-unified account as well. The internal structures of English and Mandarin nominals are presented in (7).

(7) English: $[_{DP}\,[_{NumP}\,-s\,[_{NP}\,]]]$
Mandarin: $[_{DP}\,-men\,[_{NumP}\,[_{ClP}[_{NP}\,]]]]$

According to her proposal, the noun in English is obligatorily raised to the functional head, Number (Num), and then the plural marker *–s* is suffixed to the noun. On the other hand, in Mandarin the overt Cl head between NumP and NP will block the N-to-Num movement because of the Head Movement Constraint (Travis 1984). The marker *–men* is suffixed to the noun only when the noun can move up to D. However, given that English and Mandarin have an unvaried Adjective-N order[2] as show in (8) and (9) respectively, Li's postulation of head movement in English and Mandarin nominal phrases seems to be unconvincing. If there were N-to-Num movement in bare nouns, the sequences *pretty girls* and *piao^{4}liang^4 bao^{3}bei^2-men^5* should be ungrammatical, whereas the sequences ***girls pretty* and ***bao^{3}bei^2-men^5 piao^{4}liang^4* should be grammatical. Yet this is not the case. As a result, an alternative account is required.

(8) English: pretty girls
*girls pretty

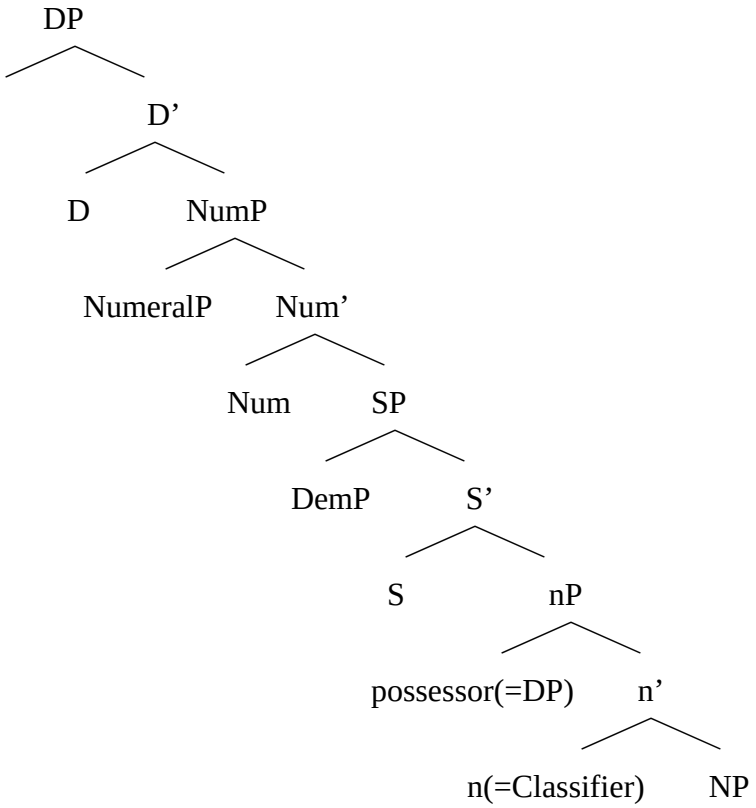
(9) Mandarin: piao^{4}liang^4 bao^{3}bei^2-men^5
pretty babe-MEN
'pretty babes'
*bao^{3}bei^2-men^5 piao^{4}liang^4
babe-MEN pretty

4. My Proposal: A Probe-Goal Approach

Although there is still a debate on the internal structure of the nominal phrase across languages, I will argue for the existence of DP in all languages and show how the composition of the nominal phrase may bear on issues of referentiality, specificity, quantification, and definiteness in order to maintain a unified structure account, namely the DP Hypothesis, cross-linguistically. The syntactic structure that I postulate is schematized as:

[2] I assume that the adjective can be adjoined to the NP or nP.

(10)



In order to maintain the idea that the nominal structures are essentially the same cross-linguistically, I assume that the head of DP is the locus of the [Definite] feature (henceforth [Def]), the head of Number Phrase (NumP) is the locus of the [Number] feature (henceforth [Num]), the head of Specificity Phrase (SP) is the locus of the [Specific] feature (henceforth [Spec])[3], and the light noun projection (nP), which is lexically realised as the classifier in classifier languages (i.e. Chinese), is the locus of the [Referential] (henceforth [Ref]), [Countable] (henceforth [Count]), and [Unit] features. In terms of feature interpretability (Chomsky 1995), the aforementioned feature carried by each functional projection is interpretable. However, the head of each functional projection bears not only the interpretable feature but also several uninterpretable features related to the other functional projections. For instance, the D head is composed of an interpretable [Def] feature and the uninterpretable [Num], [Spec] and [Ref] features. According to Chomsky's (2001) Probe-Goal theory, the interpretable feature of each functional head interacts with the uninterpretable features of other functional heads via

[3] It is assumed that definite nominals are not necessarily specific. For instance, the nominal phrase *the bus* in (i) is definite but nonspecific.

(i) Every morning I take the bus to school.

the operation Agree. For example, the D head with the interpretable [Def] feature and the unvalued uninterpretable [Ref] feature serves as the Probe, while the n head with the interpretable [Ref] feature and the unvalued uninterpretable [Def] feature serves as the Goal. The interpretable [Def] feature on D matches and deletes the unvalued uninterpretable [Def] feature on n by Agree, while the interpretable [Ref] feature on n matches and deletes the unvalued uninterpretable [Ref] feature on D by Agree.

As for the parametric variation, I assume it can be limited to two sources: (i) how the movement-triggering feature (namely [EPP]) on different functional heads (i.e. D, Num and n) can be satisfied (i.e. by DP-internal head/phrasal movement); (ii) how the (un)interpretable features on different functional heads can be phonetically realised.

5. Data Analyses

In this section, I will analyse the data from English and Mandarin Chinese based on the proposal presented in the previous section to explain the parametric variation between these two languages.

5.1. Bare Nouns in English and Mandarin and Bare Plurals in English

In contrast to French, genericity in English is conveyed by mass nouns or bare plurals as shown in (11).

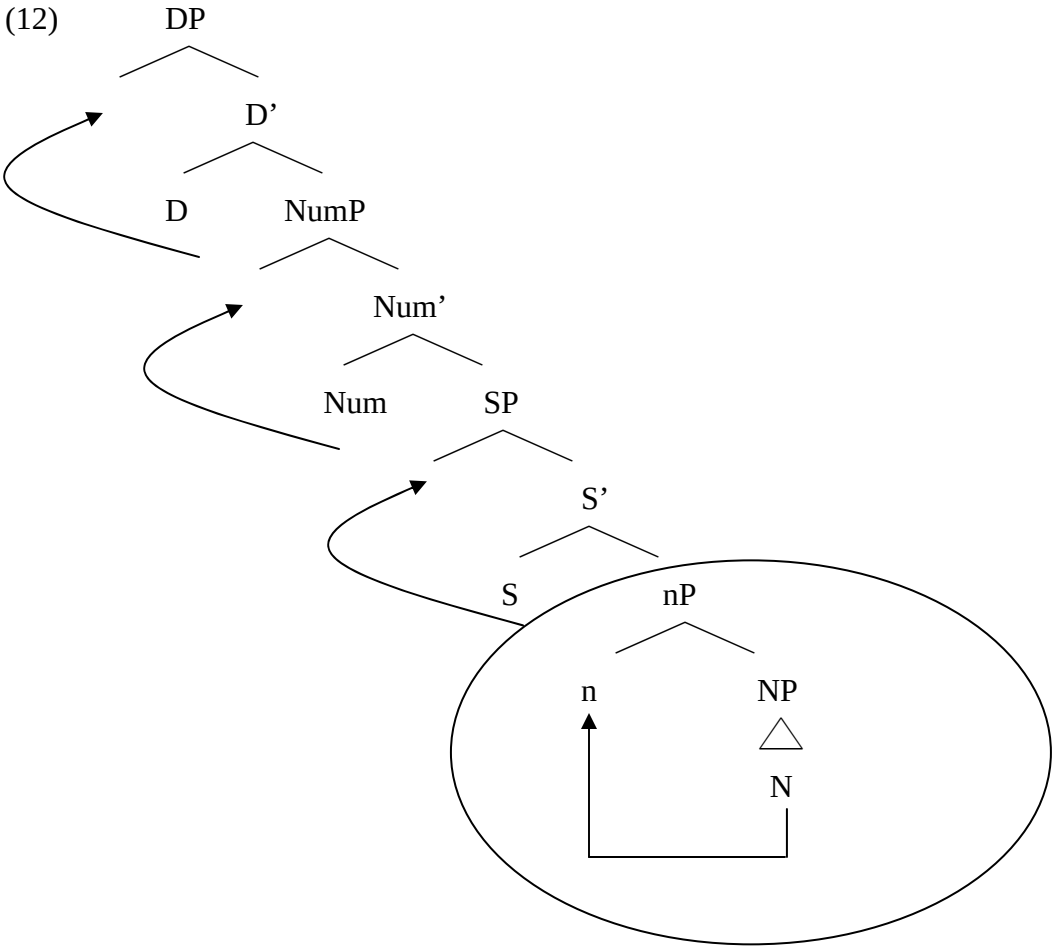
(11) a. **Rice** is good to eat.
b. I hate **cats**.

Given the assumption that the (in)definiteness of nominal phrases is determined by the feature specification of the functional head D in the universal syntactic structure in (10), I am going to provide a unified account for the derivation of the bare noun in (11a) and the bare plural in (11b), arguing that there is N-to-n movement followed by phrasal movement of nP to the Specifier (Spec) of DP.

Cinque's (1994) N-movement (head movement of N to D) analysis of bare nouns in the DP domain of Romance languages is not applicable for English, for his analysis is based on the relative order of nouns with respect to a number of modifying adjectives. Such an analysis is parallel to the head-movement analysis of verb in the clausal domain, which is based on the relative order of verbs with respect to a number of modifying adverbs. However, as indicated in (8), English has unvaried Adjective-N order; therefore, an alternative account is required for English.

On my account, there is N-to-n movement followed by phrasal movement of nP to the Spec of DP via the Spec of SP and the Spec of NumP, as illustrated in (12):

(12)



For the derivation of the bare noun and the bare plural in (11), the N (i.e. *rice* and *cat*) first merges with the n head with an interpretable [±Count] feature, which determines the countability of the phrase. The N then moves to the n head to satisfy the latter's [EPP] feature. The S head specified with an interpretable [-Spec] feature then merges with the nP, leading to the generic meaning of the whole structure. The S head with the unvalued uninterpretable [Ref] and the interpretable [-Spec] feature agrees with the n head with the interpretable [-Ref] feature and the unvalued uninterpretable [Spec] feature. The nP in turn raises to the Spec of SP to satisfy the [EPP] feature of S. The Num head with the unvalued uninterpretable [Ref] and an interpretable [Num] feature then merges with the SP. It agrees with the n head with the interpretable [-Ref] feature and the unvalued uninterpretable [Spec] feature. The nP further moves to the Spec of NumP to satisfy the [EPP] feature of Num. The D head with the interpretable [-Def] feature and the unvalued uninterpretable [Ref] then merges with the NumP. It agrees with the n head with the interpretable [-Ref] feature and the unvalued uninterpretable [Def] feature. The nP finally

reaches the Spec of DP to satisfy the [EPP] feature of D.[4] Then, within a Distributed Morphology approach, I assume that the uninterpretable [Num: Plural] feature on the n head in (11b) is spelt out by the PF component as the suffix *–s*.

The above analysis can be applied to bare nouns in Mandarin as well. However, as indicated by Cheng and Sybesma (1999, 2005), bare nouns in Mandarin can have different interpretations according to their positions in the sentence. For instance, postverbal bare nouns can be interpreted as indefinite, definite or generic, whereas preverbal bare nouns can be interpreted as definite or generic only. Examples can be found in (13) and (14):

Cheng and Sybesma (2005: 261; modified):

(13) Object position:

a. Indefinite

Hu^{2}fei^{3} mai^{3} **shu**^{1} qu^{4} le^{5}
Hufei buy book go SFP
Singular reading: 'Hufei went to buy a book.'
Plural reading: 'Hufei went to buy books.'

b. Definite

Hu^{2}fei^{3} he^{1} wan^{2} le^{5} **tang**^{1}
Hufei drink finish PRF soup
'Hufei finished the soup.'

c. Generic

Wo^{3} xi^{3}huan^{1} **gou**^{3}
I like dog
'I like dogs.'

(14) Subject position:

a. Definite

Gou^{3} jin^{1}tian^{1} te^{4}bie^{2} ting^{1}hua^{4}
dog today very obedient
Singular reading: 'The dog was very obedient today.'
Plural reading: 'The dogs were very obedient today.'

b. Generic

Gou^{3} ai^{4} chi^{1} rou^{4}
dog love eat meat
'Dogs love to eat meat.'

[4] The whole process of Agree operations on each functional head is simplified here. For instance, the D head with the interpretable [-Def] feature and the unvalued uninterpretable [Spec] also agrees with the S head with the unvalued uninterpretable [Def] and the interpretable [-Spec] feature.

According to Cheng and Sybesma's analysis, the diverse interpretations in (13) and (14) result from the different underlying syntactic structures. Instead, I propose a unified underlying structure for both definite and indefinite nominals, arguing that the feature specification of the functional heads D and S determines the (in)definiteness and specificity of the phrases. In other words, the only difference between (13a-c) or (14a-b) concerns the values of the interpretable [Def] feature on D and the interpretable [Spec] feature on S.

5.2. Nominal Phrases with Demonstrative in English and Mandarin

Given that specificity can be encoded by a demonstrative in English and Mandarin, this section turns to the Demonstrative-Numeral-N sequence in English and the Demonstrative-Numeral-Classifier-N sequence in Mandarin. I propose that they involve the movement of DemP to the Spec of DP via the Spec of NumP. This movement is triggered by the [EPP] feature with the match and deletion of an uninterpretable [Deictic] feature carried by the head of DP. More specifically, I assume that the Dem is specified for an interpretable [Deictic] feature (i.e. [Proximal] or [Distal]) and this feature values and deletes the uninterpretable [Deictic] feature on the head of DP via Agree. In turn, the interpretable [+Def] feature on the head of DP matches and deletes the uninterpretable [Def] feature carried by the Dem via Agree. The DemP then moves to the Spec of DP to satisfy the [EPP] feature on D.

6. Concluding Remarks

As demonstrated in the previous section, a unified structure of encoding definiteness and number can be reached by the current Probe-Goal approach. The idea that the projection of DP is a property of UG can also be maintained, which allows article-less languages (i.e. Mandarin) not to lexically realise the functional head D.

As for the parametric variation, I assume it can be limited to two sources: (i) how the [EPP] feature on different functional heads (i.e. D, Num and n) can be satified (i.e. by DP-internal head/phrasal movement); (ii) how the (un)interpretable features on different functional heads can be phonetically realised. In English, I propose there is N-to-n movement. The uninterpretable [Num: Plural] feature on n is phonetically realised as *–s*. As for the so-called indefinite article *a(n)*, I assume that it is a numeral base-generated in the Spec of NumP. It moves to the Spec of DP to satisfy the [EPP] feature on D. In Mandarin, the n head can be filled either by the merge of a classifier or by the N-to-n movement. Finally, the head of the DP in Mandarin is realised by a null determiner.

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