



## The Chinese *bi* comparative

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### ABSTRACT

Chinese *bi* comparatives should be divided into two types: phrasal and clausal. In the former, the prepositional subordinator *bi* introduces a standard of comparison one syntactic constituent that does not involve comparative deletion; in the latter, however, a clause with more than one standard constituent is introduced and this clause obligatorily involves comparative deletion and a degree operator-variable binding relation in syntax. Among the conditions to which building a Chinese *bi* comparative is subject, two conditions interact to disallow comparative subdeletion: (A) the *bi* phrase occurs as an adjunct phrase adjoined to the left of the predicate of comparison and (B) the standard constituent must be minimally c-commanded by its corresponding main clause correlate.

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### 1. Introduction

According to Bresnan (1973), English phrasal comparatives such as (1a) are derived from clausal counterparts (i.e., (1b)) through a complex derivational process, as (2) illustrates (Hankamer, 1973; Chomsky, 1977; Brame, 1983; Hoeksema, 1983; Napoli, 1983):

- (1) a. John is taller than Bill.  
 b. John is taller than Bill is.
- (2) DS: John is er [than [Bill is what-tall]]-tall.  
 SS: John is er [what<sub>i</sub> [than [Bill is t<sub>i</sub>-tall]]]-tall. (wh-movement)  
 PF: John is tall-er [what<sub>i</sub> [than [Bill is t<sub>i</sub>-tall]]]. (clausal/extraposition/deletion)  
 John is tall-er [what<sub>i</sub> [than [Bill is t<sub>i</sub>-tall]]]. (phrasal/extraposition/deletion)  
 LF: [-er [what<sub>i</sub> [than [Bill is t<sub>i</sub>-tall]]]<sub>j</sub> John is t<sub>j</sub>-tall. (QR the *er*-phrase)

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Behind this analysis is the idea of degree comparison: in phrasal and clausal comparatives, the morpheme *-er* requires the maximal degree associated with the matrix adjective to be greater than the maximal degree associated with the adjective in the *than* clause (Heim, 1985; Kennedy, 1999, 2007).

Recently, studies on Chinese *bi* comparatives have heatedly debated whether Chinese *bi* comparatives like (3a and b) are derived from their clausal counterparts (Cheng, 1966; Hashimoto, 1966, 1971; Fu, 1978; Tsao, 1990; Paul, 1993; Liu, 1996; Xiang, 2005; Kennedy, 2007; Erlewine, 2007; Lin, 2009).<sup>1</sup>

- (3) a. Zhangsan zuotian zai xuexiao bi Lisi jintian zai jiali kaixin.  
Zhangsan yesterday at school than Lisi today at home happy  
'Yesterday, Zhangsan was happier at school than Lisi is at home today'.  
b. Zhangsan bi Lisi gao.  
Zhangsan than Lisi tall  
'Zhangsan is taller than Lisi'.

On one hand, under the framework of early generative-transformational grammar, Cheng (1966), Hashimoto (1966, 1971), and Fu (1978) analyze the *bi* comparative as a clausal comparative by assuming that what are compared is a pair of degree variables. For example, Fu (1978:86–114) suggests that the deep structure of examples like (3b) consists of three clauses (i.e., DS in (4)), in which the abstract predicate *bijiao* 'compare' takes two parallel propositions (i.e., S<sub>1</sub> and S<sub>2</sub>), each further dominated by an NP. These two compared propositions are further modified by variables of indefinite degree modifiers (i.e., X and Y), and X > Y. Having this deep structure as input, the step-by-step derivational process of (3b) can be succinctly described as follows:

- (4) DS: [S<sub>0</sub> [NP<sub>1</sub> [S<sub>1</sub> Zhangsan X gao]] [NP<sub>2</sub> [S<sub>2</sub> Lisi Y gao]] [V *bijiao*]]  
Step 1: [S<sub>0</sub>' [NP<sub>1</sub> [S<sub>1</sub> Zhangsan X gao]] [VP [NP<sub>2</sub> [S<sub>2</sub> Lisi Y gao]] [V *bijiao*]]]  
Step 2: [S<sub>0</sub>' [NP<sub>1</sub> Zhangsan X gao] [VP [NP<sub>2</sub> bi [S<sub>2</sub> Lisi Y gao]] [V *bijiao*]]]  
Step 3: [S<sub>1</sub> [NP<sub>1</sub> [S<sub>1</sub> Zhangsan ~~X gao~~] [VP bi [NP Lisi ~~gao~~] [V *bijiao* gao]]]  
Step 4: [S<sub>0</sub>' [NP Zhangsan] [VP bi [NP Lisi] ~~*bijiao*~~ gao]]  
SS: Zhangsan bi Lisi gao.

First, NP<sub>1</sub> undergoes Subject Raising and Chomsky adjunction to S<sub>0</sub>. Second, an operation adjoins the complementizer-like marker *bi*, which does not exist in the underlying structure, to NP<sub>2</sub> and Y is deleted. Third, the variable degree marker X has undergone VP lowering and substitutes the VP of S<sub>0</sub>'. Then, the identical adjective in S<sub>2</sub> is deleted and S<sub>2</sub> is replaced by the left NP. Finally, *bijiao* is deleted to derive the surface structure.

On the other hand, inspired by Beck et al.'s (2004:325) and Kennedy's (2005:20–21) study on the parametric variations on comparison, Xiang (2005), Erlewine (2007), and Lin (2009), though differing from each other in some details of analysis and assumption, argue that the Chinese *bi* comparative cannot be analyzed as a clausal comparative, as Fu (1978) and others suggest. The most important counter-argument provided by them is: If Chinese comparatives are derived via a derivational process similar to what is shown in (4), why does (5a), taken from Lin (2009:7), differ from its English counterpart (5b), in not allowing comparative subdeletion in syntax?

- (5) a. \*Zhe-zhang shuzhuo [bi na-zhang zhuozi (liang-cun/name) chang] kuan.  
This-CL desk than that-CL desk two-inch/that long wide  
b. This desk is wider than that table is (\*two inches/\*that) long.  
c. Michael Jordan has more scoring titles than Dennis Rodman has  
(\*two/\*many) tattoos.

<sup>1</sup> In this paper, I gloss the marker *bi* as 'than' simply for ease of exposition. It does not mean I take it for granted that the marker *bi* has *than* as its English counterpart because they differ from each other in many aspects; for example, the marker *than* can take a manner adverb as complement but *bi* cannot, as shown below.

- (i) He sighs, but more happily than sadly (Lin, 2009:17)  
(ii) \*Wo zhenxinde bi zhenchengde (geng) guanxin ni.  
I sincerely than genuinely even-more care-about you

According to Bresnan (1977), in English comparative subdeletion constructions such as (5b-c), an amount or degree term must be omitted from the constituent (i.e., the compared constituent (e.g., *long* in (5b))) that provides the point of comparison with the morphologically marked phrase in the main clause (i.e., the head of the comparative (e.g., *wider* in (5b))). Note that this is not a semantic restriction: (5b) could in principle mean something like ‘the width of this desk is greater than the length of that table, and the difference is *two inches/that*’. However, as the ungrammaticality of (5a) indicates, Chinese does not allow comparative subdeletion, though the grammaticality of (6) indicates that Chinese does allow subcomparison in semantics.<sup>2</sup>

- (6) Zhe-zhang shuzhuo de kuandu bi na-zhang shuzhuo de changdu da  
 This-CL desk DE width than that-CL desk DE length great  
 liang-cun.  
 two-inch  
 ‘The width of this desk is greater than the length of that one by two inches.’

Central to this debate are the following two questions: Is the phrasal versus clausal distinction needed in studying the syntax and semantics of Chinese *bi* comparatives? Does the Chinese *bi* comparative involve degree comparison (or a degree operator-variable binding relation) in syntax? (To avoid confusion, the *bi* clausal comparative here is defined as one in which the marker *bi* introduces a clause obligatorily involving comparative deletion, while the *bi* phrasal comparative is one in which the marker *bi* introduces a phrase not involving comparative deletion.)

Assuming that the phrasal versus clausal distinction is needed in studying the syntax and semantics of the Chinese *bi* comparatives, I argue here for a hybrid analysis to Chinese *bi* comparatives which consists of the following five assumptions: (A) The marker *bi* is a prepositional subordinator that takes a (non-)clausal complement, and forms a pre-predicate adjunct phrase with its complement. (B) Not carrying the meaning denoted by the English comparative morpheme *-er*, the marker *bi* functions to introduce (a) standard constituent(s) (e.g., *Lisi* in (3a)) in a contrastive relation to its/their corresponding main clause correlate(s) (e.g., *Zhangsan* in (3a)) (Lu et al., 1980:61). (Here, the term ‘correlate’ means ‘the main clause counterpart with which the standard constituent is compared’.) (C) The *bi* comparative where the marker *bi* introduces as the standard of comparison one constituent that does not involve comparative deletion is analyzed as the *bi* phrasal comparative; those *bi* comparatives where more than one standard constituent is contained in the complement clause of the marker *bi* are analyzed as clausal comparatives, and this clause obligatorily involves comparative deletion and a degree operator-variable binding relation in syntax. (D) The standard constituent, in either the *bi* phrasal or clausal comparative, not only has to be minimally c-commanded by its corresponding correlate but also has parallel it in category and semantics (Paul, 1993). Additionally, the complement clause of the marker *bi* must be parallel to the minimal clause containing the *bi* phrase in the basic syntactic structure. (E) In the *bi* clausal comparative, comparative deletion obligatorily deletes all the subelements of the clause introduced by the marker *bi* except those in a contrastive relation to their corresponding correlates. To recover the content of the ‘elided’ site, the ‘elided’ constituent must be *e*-given (Merchant, 2004). And the ‘salient’ antecedent of the elided site retrieved from the main clause must be as minimal as possible by consisting only of a degree variable and a predicate that can form with the standard constituents a clause the same as the minimal clause containing the *bi* phrase in the sentence type.

The organization of this paper is as follows. In section 2, I thoroughly describe the syntax and semantics of Chinese *bi* comparatives, and then crystallize the empirical and theoretical questions raised by this construction. In section 3, I review two representative analyses from the previous literature, and then point out that neither a pure clausal nor a pure non-clausal analysis can well account for the facts. Section 4 presents my own analysis. I first propose a hybrid analysis to the syntax and semantics of the Chinese *bi* comparatives, and then some empirical and theoretical implications are discussed. Finally, the conclusion is stated in section 5.

## 2. The syntactic and semantic properties of *bi* comparatives

In this section, I first comprehensively describe the syntactic and semantic properties of the Chinese *bi* comparatives from eight perspectives: the syntactic properties of the *bi*-standard sequence, the number of standard(s) introduced by the marker

<sup>2</sup> One anonymous reviewer provides example (i) to show that Chinese allows subcomparison in semantics.

- (i) Shuzhuo de kuandu bi xiezi-tai de changdu hai kuan.  
 Desk DE width than writing-desk DE length even-more wide  
 ‘The width of the desk is even wider than the length of the writing desk.’

Frankly speaking, this is the first time I have heard and seen this kind of sentence. To verify its grammatical status, I checked with twenty-three native speakers. Only eight of them accept it as a grammatical sentence. Nevertheless, in this paper what I study is why Chinese does not allow comparative subdeletion in syntax. So, this example, even if it is grammatical, has no significant impact on my study because it does not involve comparative subdeletion in syntax. Those who accept example (i) as grammatical might allow the main predicate *kuan* ‘wide’ not only to provide a dimension of ‘width’ but also ‘length’. So the comparison involved becomes possible. The semantics of (i), which is treated as a *bi* phrasal comparative under my analysis, then can be generated by Heim’s (1985) direct analysis to the semantics of phrasal comparatives. Given this, examples like (i) will not be discussed in the rest of this paper.

*bi*, the category of the standard, the syntactic and semantic relation(s) among the standards, deletion, the constraints on the standard(s), the explicit comparison, and the function of *bi*. After this, I clearly point out all the questions that any analysis to the Chinese *bi* comparative has to deal with.

### 2.1. The syntactic properties of the *bi*-standard sequence

From the perspective of the syntactic properties of the *bi*-standard sequence, the *bi* comparative has three features. First, a *bi*-standard sequence can be connected with another one by a coordinator like *huozhe* 'or', or it can occur as an independent fragment, as shown by (7a and b), respectively (Liu, 1996:220; Lin, 2009:25).

- (7) a. Zhangsan bi Lisi huozhe (bi) Wangwu dou haiyao gao.  
 Zhangsan than Lisi or than Wangwu all even tall  
 'Zhangsan is taller than either Lisi or Wangwu.'
- b. Ta-de shengao bi wo haiyao ai, bi Yaoming na geng shi  
 He-DE height than I even short than Yaoming then even-more is  
 tian cha di yuan le.  
 heaven differ ground far SFP  
 'He is much shorter than I am. If compared with Yaoming, his height is even like the distance between the heaven and the ground.'

In addition, as the contrast between (8a and b) and (9a and b) indicates, the *bi*-standard sequence can only be 'adjoined' to the left of a predicate that is gradable like *gao* 'tall' in (8a) or that contains a gradable element, as shown by (8b), where the predicate *pao-de kuai* 'run-DE fast' contains the gradable element *kuai* 'fast'.

- (8) a. Zhangsan [bi Lisi [gao]].  
 Zhangsan than Lisi tall  
 'Zhangsan is taller than Lisi.'
- b. Zhangsan [bi Lisi [pao-de \*(kuai)]].  
 Zhangsan than Lisi run-DE fast  
 'Zhangsan runs faster than Lisi does.'
- (9) a. \*Zhangsan [[gao] bi Lisi].  
 Zhangsan tall than Lisi  
 'Zhangsan is taller than Lisi.'
- b. \*Zhangsan [[pao-de \*(kuai)] bi Lisi].  
 Zhangsan run-DE fast than Lisi  
 'Zhangsan runs faster than Lisi does.'

So the *bi*-standard sequence forms a syntactic constituent by itself and occurs as an adjunct phrase adjoined to the left of a main predicate that is gradable or contains a gradable element (Paul, 1993; Liu, 1996; Shi, 2001).

Second, the *bi* phrase, as Shi (2001:151) argues, can only occur within a certain domain: after the subject but before the predicate (or the manner/degree adverb if the predicate is modified by a manner/degree adverb).<sup>3,4</sup>

<sup>3</sup> One anonymous reviewer says the original (10a) (i.e., (i) taken from Shi (2001:151)) sounds much worse to him/her.

- (i) Jinnian Zhangsan bi qunian pang-duo le.  
 This-year Zhangsan than last-year fat-more SFP  
 'Zhangsan gets fatter than he did last year.'

So, I have (i) replaced with the new (10a), and all of the twenty-three native speakers I have consulted accept the new (10a) as a grammatical sentence. Likewise, all these informants accept (ii) as a grammatical sentence.

- (ii) Zai xuexiao xuesheng zongshi bi zai jiali tinghua.  
 At school student always than at home well-behaved  
 'Students are always more well-behaved in school than at home.'

- (10) a. Xianzai wo erzi bi yiqian guai-duo le.  
Now I son than before well-behaved-more SFP  
'Now my son is more well-behaved than before.'
- b. Wo erzi xianzai bi yiqian guai-duo le.  
I son now than before well-behaved-more SFP  
'Now my son is more well-behaved than before.'
- c. Zhangsan bi Lisi (geng) zhenxinde guanxin ni.  
Zhangsan than Lisi even-more sincerely care-about you  
'Zhangsan more sincerely cares about you than Lisi does.'
- (11) a. \*Xianzai bi yiqian wo erzi guai-duo le.  
Now than before I son well-behaved-more SFP
- b. \*Zhangsan geng bi Lisi zhenxinde guanxin ni.  
Zhangsan even-more than Lisi sincerely care-about you
- c. \*Zhangsan zhenxinde bi Lisi guanxin ni.  
Zhangsan sincerely than Lisi care-about you

Furthermore, as (10a) indicates, the marker *bi* is not required to be flanked by the standard constituent and its correlate (i.e., the main clause counterpart with which the standard constituent is compared).

Third, as Teng (1985:472) points out, the distinction between the negated adjectival predicate *bu gao* 'not tall' and the negated adjectival predicate *bu-shufu* 'uncomfortable', as shown below, in fact corresponds to the contradictory (e.g., *black* versus *non-black*) versus contrary (e.g., *black* versus *white*) distinction (Jespersen, 1924:322; Klima, 1964; Lu, 1984:223–229).

Thus, the existence of examples like the new (10a) and (ii) should not be neglected. Based on example (iii), another reviewer points out to me that a reason clause can follow a frequency adverb.

- (iii) Zhangsan shichang yinwei Lisi queke er shengqi.  
Zhangsan often because Lisi absent then get-angry  
'Zhangsan often gets angry because Lisi is absent.'

So a reason clause is expected to occur as the standard of comparison, and the fact bears out this expectation, as the grammaticality of (iv), provided by the reviewer, shows.

- (iv) Laoban yinwei ta jingchang chidao bi yinwei ta ou'er fan cuo  
Boss because he often late than because he sometimes make mistake  
hai geng shengqi.  
even more angry  
'The boss is even more angry because he is often late than because he sometimes makes mistakes.'

<sup>4</sup> LaPolla (1990), based on the 'topic-comment' constructions like (i), claims that the first of the two compared constituents in Li and Thompson's (1981) pattern has to be a topic.

- (i) Xiang bi xiong bizi chang.  
Elephant than bear nose long  
'Elephants have longer noses than bears.'

However, example (i) is only a counterexample at first sight because Teng (1974) has shown that a Chinese 'NP NP VP' structure might allow for two different analyses, as illustrated by (ii) and (iii), respectively (Tsao, 1990; Shi, 2001:153–154; Liu et al., 2004:664).

- (ii) [<sub>IP</sub> Subject [<sub>Predicate</sub> NP VP]]  
(iii) Topic [<sub>IP</sub> Subject VP]

For instance, sentence (iv) might have a syntactic structure like (ii) as evidenced by the acceptability of VP-level adverbs (e.g., *ye* 'also') which are restricted to a position to the right of the subject, as (v) shows.

- (iv) Xiang bizi chang.  
Elephant nose long  
'An elephant has a long nose.'
- (v) [<sub>IP</sub> Xiang ye [<sub>Predicate</sub> bizi chang]].  
Elephant also nose long  
'An elephant also has a long nose.'

So, the validity of LaPolla's (1990) claim is questioned.

- (12) a. Zhangsan bu gao.  
 'Zhangsan not tall  
 'Zhangsan is not tall, but it is not necessary for him to be short.'
- b. Zhangsan bu-shufu.  
 Zhangsan un-comfortable  
 'Zhangsan is uncomfortable.'

The contradictory terms, as Teng (1985:471–473) argues, are syntactic facts while contrary terms are lexical facts because only contrary terms, like adjectives, can be modified by a degree adverb, as illustrated by the contrast below.

- (13) a. \*Zhangsan feichang bu gao.  
 Zhangsan extremely not tall
- b. Zhangsan feichang bu-shufu.  
 Zhangsan extremely un-comfortable  
 'Zhangsan is extremely uncomfortable.'

In other words, [<sub>A</sub> *bu-shufu*] 'uncomfortable' in (13b) is a compound word on a par with [<sub>A</sub> *un-comfortable*], in contrast with the phrasal status of *bu gao* 'not tall' in (13a). Given this distinction, the contrast between (14a) and (14b) implies that the syntactic negation marker *bu* 'not' (i.e., the contradictory negation marker) cannot occur after the *bi* phrase (Teng, 1985:473).<sup>5</sup>

- (14) a. \*Zhangsan bi Lisi bu gao.  
 Zhangsan than Lisi not tall
- b. Zhangsan bi Lisi bu-gaoxing.  
 Zhangsan than Lisi un-happy  
 'Zhangsan is more unhappy than Lisi.'

## 2.2. The number of standard constituent(s)

As Liu (1996) and Shi (2001:154–155) argue, under the following two contexts, the number of standard constituents introduced by the marker *bi* is one: The first one, as exemplified by (15a), involves a context where only one standard constituent is introduced. The second one apparently contains 'more than one standard constituent', but these 'standard constituents' indeed form a subject-predicate relation and belong to a single phrase (i.e., a clause), as (15b) illustrates.

- (15) a. Zhangsan bi Lisi kaixin. (one)  
 Zhangsan than Lisi happy  
 'Zhangsan is happier than Lisi.'
- b. [Ni qu] bi [wo qu] heshi. (one)  
 You go than I go appropriate  
 'It is more appropriate for you to go than for me to go.'

In the second type, the main predicate has to be one that can take a sentential subject. However, the number of standard constituents is more than one in examples like (16a), where the standard constituents (i.e., *Lisi* and *zuotian* 'yesterday') do not belong to a single phrase, nor do they form a subject-predicate relation, as the ungrammaticality of (16b) shows.

<sup>5</sup> One anonymous reviewer provides example (i) and (ii), where the negation marker *bu* 'not' can only be analyzed as a syntactic negation marker for a verb, and then suggests the syntactic negation marker *bu* 'not' can occur after the *bi* phrase in examples like (iii).

- (i) Zhangsan bu tai xiangxin ni.  
 Zhangsan not very believe you  
 'Zhangsan does not believe you so much.'
- (ii) Ni zheme zuo bu zenme yinggai.  
 You this do not how should  
 'It is not so appropriate for you to do it this way.'
- (iii) Zhangsan bi Lisi geng bu (\*tai) yinggai.  
 Zhangsan than Lisi even-more not too should  
 'Zhangsan is even more inappropriate than Lisi in doing this way.'

If the negation marker *bu* 'not' in (iii) is a syntactic element, we would expect some syntactic constituent could be inserted between *bu* 'not' and *yinggai* 'should'. However, this expectation is not borne out. In addition, the reviewer's comment can hold only if the possibility of analyzing the negation marker *bu* 'not' in (iii) as a lexical negation marker can be excluded. But, it is very difficult to exclude this possibility.

- (16) a. Zhangsan jintian bi Lisi zuotian kaixin. (two)  
 Zhangsan today than Lisi yesterday happy  
 'Zhangsan is happier at home than Lisi was in school yesterday.'
- b. \*Lisi zuotian.  
 Lisi yesterday

So the number of standard constituents in the *bi* comparatives can be one or more than one.

### 2.3. The category of the standard constituent(s)

Since the standard constituent(s) must be parallel to its corresponding main clause correlate(s) in category and semantics, the category of standard constituents can be a subject NP, a temporal NP, a locative PP, a *ba* disposal 'phrase', or an instrument phrase, as illustrated by the standard constituents in (17) in the left-to-right sequential order (Tsao, 1990).<sup>6</sup>

- (17) Zhangsan jintian zai xuexiao ba xigua yong cai dao bi Lisi zuotian  
 Zhangsan today at school BA watermelon with food knife than Lisi yesterday  
zai jiali ba nangua yong xigua dao qie-de geng xi.  
 at home BA pumpkin with watermelon knife cut-DE more small  
 'Today Zhangsan uses a knife for food to cut a watermelon into pieces smaller than Lisi used a knife for watermelons to cut a pumpkin yesterday.'

Further, the category of the standard constituent can also be a preposed postverbal object of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected, a *bei* 'phrase' (i.e., a passive structure), a reason clause, or even a clause, as illustrated by (18a–d), respectively (see footnote 16 and Lin, 2009).<sup>7,8</sup>

<sup>6</sup> Please see footnote 23 for discussion on why the standard constituent(s) must be parallel to its corresponding main clause correlate(s) in category and semantics. The syntactic properties of examples containing the *ba* disposal structure are discussed in section 4.1.

<sup>7</sup> Please see example (64) for the syntactic structure of cases containing a *bei* 'phrase'. Besides, based on examples (i)–(iii), Tsao (1990:294–295) suggests that comparison of two objects by means of the object fronting topicalization process is possible only when they are both inanimate.

- (i) \*Wo Zhangsan bi Lisi xihuan.  
 I Zhangsan than Lisi like  
 'I like Zhangsam more than I like Lisi.'
- (ii) ?Wo mao bi gou xihuan.  
 I dog than cat like  
 'I like dogs more than I like cats.'
- (iii) Wo daishu bi jihexue xihuan.  
 I algebra than geometry like  
 'I like algebra more than geometry.'

However, this description is not without problems because a sentence involving a comparison between two fronting human object NPs like (18a) is possible. That is, besides the prominent interpretation (with the prime minister *Zhou Enlai* and the vice prime minister *Deng Xiaoping* as subjects and terms of comparison: *With respect to Chair Mao, Zhou Enlai trusts him more than Deng Xiaoping*), we can also obtain a pragmatically induced/preferred interpretation with both *Zhou Enlai* and *Deng Xiaoping* as (fronted) objects for (18a): *Chair Mao has more confidence in Zhou Enlai than in Deng Xiaoping*.

<sup>8</sup> As one anonymous reviewer points out, examples like (i) show that manner adverbs might occur as the standard constituent in the *bi* comparative.

- (i) Shengri manmande bi kuaikuaide dao geng ling ren qidai.  
 Birthday slowly than quickly arrive even-more make people anticipated  
 'For your birthday to come more slowly than quickly is even more anticipated.'

As is well accepted, a *bi* phrase can only be adjoined to a predicate that is gradable or contains a gradable element. However, the position to which the *bi* phrase *bi kuaikuaide* 'than quickly' is adjoined in (i) is the VP headed by the non-gradable dynamic predicate *dao* 'arrive'. So, we have strong reason to believe that example (i) is a form reduced of a sentence like (ii).

- (ii) [[Shengri manmande ~~dao~~] [[bi [~~shengri~~ kuaikuaide dao]] geng ling ren qidai]].  
 Birthday slowly arrive than birthday quickly arrive even-more make people anticipated  
 'For your birthday to come more slowly than quickly is even more anticipated.'

In other words, the standard constituent is the clause *shengri kuaikuaide dao* 'birthday quickly arrive' rather than the manner adverb *kuaikuaide* 'quickly'.

- (18) a. Mao zhuxi Zhou Enlai bi Deng Xiaoping haiyao xinren.  
Mao chair Zhou Enlai than Deng Xiaoping even-more trust  
i. 'Zhou Enlai trusts Chair Mao<sub>i</sub> more than Deng Xiaoping trusts him<sub>i</sub>.'  
ii. 'Chair Mao<sub>i</sub> trusts Zhou Enlai more than he<sub>i</sub> trusts Deng Xiaoping.'
- b. Zhangsan bei Lisi bi bei Wangwu da-de geng qican.  
Zhangsan BEI Lisi than BEI Wangwu hit-DE even-more pitifully  
'Zhangsan<sub>i</sub> was beaten more pitifully by Lisi than he<sub>i</sub> was beaten by Wangwu.'
- c. Beigao yinwei fan du hui bi yinwei qiangjie er geng  
Accused because sell drugs will than because rob then even-more  
youkeneng bei pan zhong xing.  
possible BEI judge severe penalty  
'It is more possible for the accused to be given a severe penalty because he sold drugs than because he robbed.'
- d. [Ni qu] bi [wo qu] heshi.  
You go than I go appropriate  
'It is more appropriate for you to go than for me to go.'

#### 2.4. The relation among the standard constituents

Suppose more than one standard constituent is involved; then among the standard constituents three restrictions exist: First, none of the standard constituents can be a preposed postverbal object NP of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected, as shown by the contrast below.

- (19) a. Zhangsan shuxue bi wuli xihuan.  
Zhangsan mathematics than physics like  
'Zhangsan likes mathematics more than physics.'
- b. \*Zhangsan (xianzai) shuxue bi Lisi (yiqian) wuli xihuan.  
Zhangsan now mathematics than Lisi past physics like  
'Zhangsan likes mathematics more than Lisi liked physics.'

However, one anonymous reviewer points out this claim might be challenged by the following two examples.

- (20) a. Zhangsan xianzai shuxue bi Lisi yiqian wuli xue-de  
Zhangsan now mathematics than Lisi before physics learn-DE  
geng hao.  
even-more good  
'Now Zhangsan learns mathematics even better than Lisi learned physics in the past.'
- b. Zhangsan xianzai wuli bi Lisi yiqian shuexue hua-le geng  
Zhangsan now physics than Lisi before mathematics spend-ASP more  
duo shijian yandu.  
more time study  
'Now Zhangsan spends more time in studying physics than Lisi did in mathematics.'

Although both (20a and b) are acceptable, I want to argue that it is not necessary for the so-called 'preposed object' NP here to be analyzed as the real postverbal object of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected.

Significantly crucial to (20a) is that this sentence is a descriptive *V-de* complement construction. According to Tang (1990) and Huang (1992, 2006), in the descriptive *V-de* construction, for instance (21), the 'V NP' sequence of the 'V NP V-de Result' sequence is a pre-predicate adjunct, *V-de* is the main verb, the 'Result' is the complement of *V-de*, and the V of 'V NP' sequence must be the same as V of *V-de* in phonetic value.

- (21) Zhangsan [[[v chang] [NP ge]] [[V-de chang-de] [Result hao]]].  
Zhangsan sing song sing-DE good  
'As for singing songs, Zhangsan sings well.'



So it is possible for us to analyze the main clause of (20a) (i.e., (22a)) as one with a syntactic structure like (22b), in which the first verb *xue* 'learn' is deleted.

- (22) a. Zhangsan (xianzai) shuxue xue-de geng hao.  
Zhangsan now mathematics learn-DE even-more good  
'Now Zhangsan learns mathematics even better.'
- b. Zhangsan xianzai [[~~v xue~~] [NP shuxue]] [V xue]-de [Result geng hao]].  
Zhangsan now learn mathematics learn-DE even-more good  
'Zhangsan now learns mathematics even better.'

In other words, the so-called 'preposed object NP' *shuxue* 'mathematics' in (20a) in fact can be analyzed as the reduced form of the pre-predicate adjunct phrase *xue shuxue* 'learn mathematics'. Since the NP *shuxue* 'mathematics' occurs as object in the pre-predicate adjunct phrase *xue shuxue* 'learn mathematics', the 'compared constituent' *shuxue* 'mathematics' can be understood as 'object'. But, this 'object' is not one preposed from the postverbal position of the main verb. Although such an analysis involves backward deletion, backward deletion indeed is not impossible in Chinese, especially in constructions with a subordinated structure like (23a and b).<sup>9</sup>

- (23) a. Yinwei ni ye yao ~~qu~~, suoyi wo cai yao qu.  
Because you also will go so I then will go  
'Because you will go, so I will go.'
- b. Yinwei ni ye keyi ~~liu xialai~~, suoyi ta cai keyi liu xialai.  
Because you also can stay down-come so he then can stay down-come  
'Because you also can stay here, so he can stay here too.'

On the other hand, I argue that example (20b), raised by the reviewer, can actually be analyzed as a coordinated structure containing two clauses, as (24) shows.

- (24) [<sub>S1</sub> Zhangsan xianzai wuli bi Lisi yiqian shuxue hua-le geng  
Zhangsan now physics than Lisi before mathematics spend-ASP more  
duo shijian] [<sub>S2</sub> Pro yandu Pro].  
more time study

Having (20b) analyzed as (24) gets support from the grammaticality of (25), in which the verb *hua* 'spend' already takes the NP *hen duo shijian* 'very much time' as object.

- (25) Zhangsan xianzai wuli hua-le hen duo shijian.  
Zhangsan now physics spend-ASP very much time  
'Now Zhangsan spends a lot of time in physics.'

Given that the possibility of analyzing the NP *wuli* 'physics' in (25) as a based-generated adjunct topic cannot be excluded, it is difficult to say that the NP *wuli* 'physics' can only be analyzed as a preposed object of the verb *hua* 'spend' in (25). So, (20a and b) cannot be used as irrefutable counter-arguments to the claim that none of the standard constituents in a *bi* comparative with more than one standard constituent can be a preposed postverbal object NP of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected.

Second, the word order among the standard constituents must be in the canonical 'subject-temporal adjunct-locative adjunct(-pre-predicate adjunct)' order, as illustrated by the contrast between (26a) and (26b-d).<sup>10</sup>

<sup>9</sup> Among the twenty-three native speakers with whom I have checked on (23a and b), only five of them find (23a and b) marginal.

<sup>10</sup> As one anonymous reviewer points out, the 'subject-temporal adjunct-locative adjunct(-pre-predicate adjunct)' order restriction might be challenged by (i), where a 'subject-temporal adjunct-object' order is found.

- (i) Zhangsan xianzai shuxue bi Lisi yiqian wuli xue-de geng hao.  
Zhangsan now mathematics than Lisi past physics learn-DE even-more good  
'Now Zhangsan learns mathematics even better than Lisi learned physics in the past.'

As I argued above, the so-called 'object' NP here in fact can be considered as a reduced form of a pre-predicate adjunct. So (i) is not necessarily a counterexample to my observation.

- (26) a. Zhangsan jintian zai xuexiao bi Lisi zuotian zai jiali kaixin.  
Zhangsan today at school than Lisi yesterday at home happy  
'Zhangsan today is happier in school than Lisi yesterday was at home.'
- b. \*jintian Zhangsan bi zuotian Lisi kaixin.  
Today Zhangsan than yesterday Lisi happy
- c. \*Zai xuexiao Zhangsan bi zai jiali Lisi tinghua.  
At school Zhangsan than at home Lisi obedient
- d. \*Zhangsan zai xuexiao jintian bi Lisi zai jiali zuotian kaixin.  
Zhangsan at school today than Lisi at home yesterday happy

Third, the standard constituents (e.g., *Lisi*, *zuotian* 'yesterday', and *zai jiali* 'at home'), as (27) shows, have to be c-commanded by their corresponding correlates in the main clause (i.e., *Zhangsan*, *jintian* 'today', and *zai xuexiao* 'at school') (Paul, 1993; Liu, 1996; Shi, 2001:155).

- (27) [Zhangsan [jintian [zai xuexiao [[[bi [Lisi zuotian zai jiali]]]]] kaixin]]].  
Zhangsan today at school than Lisi yesterday at home happy  
'Zhangsan is happier in school than Lisi was at home yesterday.'

### 2.5. Deletion

As Tsao (1990:297–308) suggests, deletion (or ellipsis) in the Chinese *bi* comparative that contains only one standard constituent, as shown by (28a–c), can be forward or backward, depending on the (idiosyncratic) properties of the standard constituent or its correlate, and deletion here is optional.<sup>11</sup>

- (28) a. THE PRIMARY PRINCIPLE  
Ta (de) jixing bi wo (de) ~~jixing~~ hao-de duo.  
He DE memory than I DE memory good-DE many  
'Speaking of him and speaking of me, (his) memory is much better than mine.'
- b. THE PRESENT-TIME DELETION PRINCIPLE  
Zhangsan ~~xianzai~~ bi gangcai kaixn.  
Zhangsan now than a-while-ago happy  
'Zhangsan is happier than (he was) a while ago.'
- c. THE SECOND COMPARED CONSTITUENT GENITIVE DELETION PRINCIPLE  
Zhangsan-de toufa bi wo-~~de~~ chang.  
Zhangsan-DE hair than I-DE long  
'Zhangsan's hair is longer than mine.'

### 2.6. The constraints on the standard constituent(s)

From the perspective of constraints on the standard constituents, the Chinese *bi* comparative shows the following properties: First, the Chinese *bi* comparative cannot compare directly over a direct object in its postverbal position, although the English comparative can (Hashimoto, 1966, 1971).

<sup>11</sup> Tsao (1990:297–308) proposes a general principle of comparative deletion, namely, the Primary Principle, with two minor deletion principles (i.e., the Present-time Deletion Principle and the Second Compared Constituent Genitive Deletion Principle), as illustrated by (i)–(iii), respectively.

- (i) The Primary Principle  
Any compared topic, primary or non-primary, can be deleted if it is identical to another topic of an equal rank. Only forward deletion, however, is allowed.
- (ii) The Present-time Deletion Principle  
The topical constituents referring to the present time can be deleted.
- (iii) The Second Compared Constituent Genitive Deletion Principle  
When a possessive NP occurs as the second of a paired compared constituents, and the possessed NP is identical with that of the first compared constituent, then the possessive marker can be optionally deleted after the possessed NP is deleted by the rule of Identical Elements in a Compared Constituent Deletion.

- (29) a. \*Zhuli bi laoshi geng hui ma xiaozhang.  
 Assistant than teacher even-more able scold president  
 ‘The assistant<sub>i</sub> is even better in scolding the president than s/he<sub>i</sub> is good in scolding the teacher.’  
 b. John bought more books than Bill sold magazines.

That is, it is unacceptable in the intended sense of comparing objects (i.e., *The assistant<sub>i</sub> is even better in scolding the president than s/he<sub>i</sub> is good in scolding the teacher*), but it is acceptable as comparison of subjects: *The assistant is even better in scolding the president than the teacher is*.

Second, although both Chinese and English, as (30a and b) illustrate, display subcomparison in semantics, Chinese does not allow comparative subdeletion in syntax, as shown by the grammatical contrast between (31a) and (31b-c) (Tsao, 1990:310–311).

- (30) a. Zhe-zhang shuzhuo de kuandu bi na-zhang shuzhuo de changdu da.  
 This-CL desk DE width than that-CL desk DE length great  
 ‘The width of this desk is greater than the length of that one.’  
 b. The width of this desk is greater than the length of that desk.
- (31) a. \*Zhe-zhang shuzhuo [bi na-zhang zhuozi (liang-cun/name) chang] kuan.  
 This-CL desk than that-CL table two-inch/that long wide  
 b. This desk is wider than that table is (\*two inches/\*that) long.  
 c. Michael Jordan has more scoring titles than Dennis Radman has  
 (\*two/\*many) tattoos.

Third, the contrast between (32a) and (32b) seems to imply that the Chinese *bi* comparative does not allow an embedded standard (i.e., long-distance comparison), although the English clausal comparative does (Liu, 1996:219; Xiang, 2005; Erlewine, 2007; Lin, 2009).

- (32) a. \*Zhangsan jintian bi [Lisi renwei Wangwu zuotian] kaixin.  
 Zhangsan today than Lisi think Wangwu yesterday happy  
 ‘Today Zhangsan is happier than Lisi thinks that Wangwu was yesterday.’  
 b. John is taller than Bill thinks that Jack is.

## 2.7. The explicit comparison

As Shi (2001:137–138) points out, a *bi* comparative that does not contain the degree adverb *geng* ‘even more’, for example (33), does not require any pre-established degree of height on the part of *Zhangsan* or *Lisi*, as verified by (34a).

- (33) Zhangsan (xianzai) bi Lisi (yiqian) gao.  
 Zhangsan now than Lisi past tall  
 ‘Now Zhangsan is taller than Lisi was.’
- (34) a. Suiran Zhangsan (xianzai) bi Lisi (yiqian) gao, danshi liang-ge dou  
 Although Zhangsan now than Lisi past tall but two-CL all  
 bu gao.  
 not tall  
 ‘Although Zhangsan is taller than Lisi, but both of them are not tall.’  
 b. Zhangsan hen gao.  
 Zhangsan HEN tall  
 ‘Zhangsan is tall.’  
 c. Suiran Zhangsan bi Lisi gao, buguo jihu kan bu chulai.  
 Although Zhangsan than Lisi tall but almost see not appear  
 ‘Although Zhangsan is taller than Lisi, it is almost imperceptible.’

That is, (33) does not presuppose (34b), which contains the overt positive morpheme *hen* 'HEN' (Kennedy, 2007; Liu, 2010a). So no matter how tall or short Zhangsan or Lisi is, example (33) will be true as long as Zhangsan exceeds Lisi in height. Furthermore, Zhangsan's height and Lisi's height, as the grammaticality of (34c) indicates, can be so close that the difference is neither significant nor discernible. Hence, in a *bi* comparative, an ordering relation between the degrees is simply posited, and a 'crisp judgment' might be yielded. In addition, as Kennedy (2007) and Erlewine (2007) point out, the explicit measure *shi gongfen* 'ten centimeter' in a *bi* comparative like (35a) corresponds to a differential while in a *bi* comparative like (35b) it may be confused with an absolute degree.

- (35) a. Zhangsan (jinnian) bi Lisi (qunian) gao shi-gongfen.  
Zhangsan this-year than Lisi last-year tall ten-centimeter  
'This year, Zhangsan is ten centimeters taller than Lisi was last year.'
- b. \*Gen Lisi (qunian) bi-qilai, Zhangsan (jinnian) gao shi-gongfen.  
With Lisi last-year compare-qilai Zhangsan this-year tall ten-centimeter

Since the crisp judgment and the differential measurement are intrinsic features of the explicit comparison construction, Kennedy (2007) suggests the Chinese *bi* comparative is an explicit comparative (Erlewine, 2007).

## 2.8. The function of *bi*

According to Lin (2009:19–23), the meaning of comparison in the *bi* comparative is provided by the word *bi*. In other words, the word *bi* has the function the English comparative morpheme *-er* has. So Lin (2009) analyzes the marker *bi* as a degree word and the phrase headed by it as a degree phrase. This analysis, however, encounters the following empirical and theoretical problems. First, in Chinese, an adjunct degree modifier must precede and be adjacent to the gradable constituent modified by it, as shown by the contrast below.<sup>12</sup>

- (36) a. Wo dui ni hen keqi.  
I to you very courteous  
'I am very courteous to you.'
- b. \*Wo hen dui ni keqi.  
I very to you courteous

Suppose *bi* is a degree word; no other syntactic constituent should then intervene between the degree phrase headed by it and the gradable constituent modified by it. However, as the grammaticality of (37) indicates, the prediction is not borne out.

- (37) Zhangsan bi Lisi dui wo keqi.  
Zhangsan than Lisi to I courteous  
'Zhangsan is more courteous to me than Lisi is.'

Second, syntactically a degree phrase cannot occur in a position hierarchically higher than a locative phrase, as shown by the contrast below.

- (38) a. Zhangsan zai meiguo geng chidekai.  
Zhangsan at America even-more influential  
'Zhangsan is even more influential in America.'
- b. \*Zhangsan geng zai meiguo chidekai.  
Zhangsan even-more at America influential

So it is expected that a *bi* phrase, if it is analyzed as a degree phrase, cannot occur in a position higher than a locative phrase. But, this expectation is not borne out, as illustrated by (39).

<sup>12</sup> One might challenge this by pointing out that a negation marker like *bu* 'not' can be inserted between a degree modifier and the gradable predicate modified, as shown below.

- (i) Ni zhe-yang zuo tai bu yinggai.  
You this-way do too not should  
'It is too much inappropriate for you to do in this way.'

However, this claim can hold only if the possibility of analyzing the negation marker *bu* 'not' in (i) as a lexical negation marker can be excluded. But, it is not easy to exclude this possibility, as noted in footnote 5.

- (39) Zhangsan bi Lisi zai meiguo chidekai.  
 Zhangsan than Lisi at America influential  
 'In America, Zhangsan is more influential than Lisi.'

Given these facts, I suggest that the word *bi* simply functions to introduce the standard constituent(s) and the meaning of comparison in the *bi* comparative is provided by the comparative degree adverb like *geng* 'even-more' or the covert comparative morpheme (i.e., *geng*), as shown by (40a and b), respectively.<sup>13</sup>

- (40) a. Zhangsan bi Lisi geng gao.  
 Zhangsan than Lisi even-more tall  
 'Zhangsan is even taller than Lisi.'
- b. Zhangsan bi Lisi gao.  
 Zhangsan than Lisi tall  
 'Zhangsan is taller than Lisi.'

Furthermore, the word *bi* and a comparative degree morpheme like *geng* 'even-more' form a pair of correlative words. Hence, the occurrence of *bi* entails the occurrence of the comparative degree morpheme, and vice versa. So it is not necessary for both of them to occur in the *bi* comparative simultaneously. However, since the covert comparative morpheme *geng* does not have the phonetic form, it must co-occur with the word *bi*.<sup>14</sup>

All in all, the basic syntactic and semantic characteristics of the Chinese *bi* comparatives can be briefly summarized as follows: (A) the marker *bi* and the standard constituent introduced by it form an adjunct phrase adjoined to the left of the predicate providing the dimension of comparison or containing the element that provides the dimension of comparison. (B) Chinese *bi* comparatives should be divided into two types, depending on whether the number of standard constituents is one or more than one, because of the following distinction: The latter requires the standard constituent not to be a preposed postverbal object NP of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected; however, the same restriction does not hold in the former. (C) The standard constituents must be c-commanded by their corresponding main clause correlates. (D) Chinese allows subcomparison in semantics but does not allow comparative subdeletion in syntax. (E) The Chinese *bi* comparative is an explicit comparison construction, and the marker *bi* is not a degree word.

These syntactic and semantic properties, at least, bring us the following questions that any analysis of the Chinese *bi* comparatives has to deal with: First, why do examples that contain more than one standard constituent not allow a preposed postverbal object of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected to occur as the standard constituent? This question can be

<sup>13</sup> To get the meaning of comparison for examples like (40b), one might resort to the suggestion made by Xiandai Hanyu Xuci Lishi (1982:243–244) and Sybesma (1999:26–27); that is, Chinese adjectives differ from their European counterparts in that the latter choose the unmarked option for the positive degree but the former choose the unmarked option for the comparative. Namely, in European languages the comparative is morphologically marked whereas in Chinese the positive degree is marked by the most neutral 'positive degree marker *hen*', as shown by the contrast below.

- (i) a. John is taller.  
 b. John is tall.
- (ii) a. (Zhangsan han Lisi, shei gao?) Zhangsan gao.  
 Zhangsan and Lisi who tall Zhangsan tall  
 '(As for Zhangsan and Lisi, who is taller?) Zhangsan is taller.'
- b. Zhangsan \*(hen) gao.  
 Zhangsan HEN tall  
 'Zhangsan is tall.'

However, this suggestion is not without problems because the language fact is more complex than what Xiandai Hanyu Xuci Lishi (1982) and Sybesma (1999) indicate. As Zhu (1982) and Liu et al. (2004) point out, in Chinese it is possible for a positive-degree-denoting 'unmarked' gradable adjective to occur as predicate, in for example, the *bu* 'not' negation sentence, the contrastive focus construction, the *ma* particle question, the epistemic adjectival small clause, and the conditional. See Liu (2010a) for further discussion.

<sup>14</sup> The correlative relation between the word *bi* and the comparative degree morpheme in the *bi* comparative also explains the question raised by one anonymous reviewer; that is, why can we not understand (i) as a comparative construction with the covert comparative morpheme?

- (i) Ni qingchu-le ma?  
 You clear-ASP SFP  
 'Is it clear to you?'

The occurrence of the covert comparative morpheme *geng* is possible only if the sentence also contains the word *bi*. But, (i) does not; so example (i) cannot get the meaning of comparison.

further interpreted as this: How do examples with more than one standard constituent differ from those with one standard constituent in nature?

Second, what makes the standard constituents have to be in the canonical ‘subject-temporal adjunct-locative adjunct (-pre-predicate adjunct)’ order in cases with more than one standard constituent?

Third, why does Chinese not allow comparative subdeletion?

### 3. A brief review on previous analyses

There are at least five competing analyses for *bi* comparatives: the clausal analysis (e.g., Cheng, 1966; Hashimoto, 1966, 1971; Fu, 1978; Liu, 1996; Shi, 2001; Hsing, 2003; Chung, 2006); the multiple-topic analysis (i.e., Tsao, 1990); the coordination analysis (e.g., Hong, 1991); the complementation analysis (e.g., Xiang, 2005; Erlewine, 2007); and the phrasal analysis (e.g., Paul, 1993; Lin, 2009). Due to space limitations, it is impossible to review all of them here; some previous analyses like Chung (2006) and Lin (2009) have already provided an excellent review on many of the previous literatures. To see whether a pure clausal or a pure non-clausal analysis can adequately explain all the properties of the *bi* comparatives, in this section I examine only two representative previous analyses: one belonging to the group of clausal analyses (i.e., Liu, 1996), and the other the group of phrasal analyses (i.e., Lin, 2009), pointing out the merits and shortcomings of each.<sup>15</sup>

#### 3.1. The clausal analyses

Following Larson and May's (1990:119–120) analysis of English (clausal) comparatives, Liu (1996) analyzes the Chinese *bi* comparative as an instance of an antecedent-contained deletion (i.e., ACD) construction by concentrating on the following four questions:

- (41) a. Does the Chinese *bi* comparative involve coordination?  
 b. Does the Chinese *bi* comparative contain any gap inside?  
 c. How can negative polarity items get licensed in the Chinese *bi* comparative?  
 d. Why does the anti-additive effect come out?

Liu (1996:221) first argues against Hong's (1991:54–55) claim that the marker *bi* is a coordinator by pointing out that a temporal adverb like *yizhi* ‘always’ in (42) can occur between the two ‘conjunct’ phrases (i.e., *Zhangsan* and *Lisi* ‘Lisi’).

- (42) *Zhangsan yizhi bi Lisi yonggong.*  
*Zhangsan always than Lisi diligent*  
 ‘Zhangsan is always more diligent than Lisi.’

Then, by further pointing out that a *bi*-standard sequence (e.g., *bi Lisi* ‘than Lisi’ in (43a)) can be connected with another one (e.g., *bi Wangwu* ‘than Wangwu’ in (43a)) by a coordinator like *huozhe* ‘or’, Liu (1996:220–221) offers a basic syntactic configuration in which the marker *bi* and the standard constituent form a prepositional adjunct phrase with this syntactic distribution: after the subject but before the verbal/adjectival predicate (or the degree adverb if the predicate is further modified by a degree adverb).

- (43) a. *Zhangsan yinggai bi Lisi huozhe bi Wangwu dou haiyao gao yixie.*  
*Zhangsan should than Lisi or than Wangwu all even tall a-little-bit*  
 ‘Zhangsan should be even taller than either Lisi or Wangwu.’  
 b. *(\*bi Lisi) Zhangsan (bi Lisi) geng (\*bi Lisi) gao (\*bi Lisi).*  
*than Lisi Zhangsan than Lisi more than Lisi tall than Lisi*

Second, Liu (1996:222–224) argues that the temporal adverbial *zuotian* ‘yesterday’ in (44) should not belong to the main predicate; otherwise, (45a) is expected to be grammatical, contrary to fact.

- (44) *Zhangsan jintian bi Lisi zuotian kaixin.*  
*Zhangsan today than Lisi yesterday happy*  
 ‘Today Zhangsan is happier than Lisi was yesterday.’

<sup>15</sup> See Chung (2006:16–22) for discussion on the empirical and theoretical problems that Hashimoto (1966, 1971), Fu (1978), Hong (1991), and Hsing (2003) might encounter. For the multiple-topic analysis proposed by Tsao (1990), the clausal analysis made by Shi (2001), and the complementation analysis like Xiang (2005) and Erlewine (2007), see Lin (2009) for discussion. See Erlewine (2007) for the discussion on Chung (2006).

- (45) a. \*Zhangsan jintian zuotian kaixin.  
Zhangsan today yesterday happy  
b. \*Lisi zuotian.  
Lisi yesterday

Furthermore, neither can *Lisi* and *zuotian* ‘yesterday’ in (44) form a modiffee–modifier relation because a modifier for a nominal must occur before it in Chinese, nor can they form a subject–predicate relation as evidenced by the ungrammaticality of (45b). Assuming Travis’s (1988) adjunct licensing theory, Liu (1996) argues that the temporal adverbial *zuotian* ‘yesterday’ in (44) needs a head licenser; in other words, in (44) an ‘invisible’ predicate with a head that can license it is needed in the *bi* phrase. The fact that the complement clause of the preposition *bi* cannot include a dummy auxiliary like *shi* ‘is’ further leads Liu (1996:234) to suggest that (44) involves stripping (i.e., I-ellipsis). Without a local I node, the grammaticalized preposition *bi*, therefore, can exceptionally case mark the standard constituent *Lisi* across a clausal boundary. So example (44) is not ruled out by the Case Filter, but (46) is, because the embedded standard constituent (i.e., *Wangwu*) is too far away from the marker *bi* to get case-checked.

- (46) \*Zhangsan jintian [bi Lisi renwei [Wangwu zuotian \_\_\_\_]] kaixin.  
Zhangsan today than Lisi think Wangwu yesterday happy  
‘Today Zhangsan is happier than Lisi thinks that Wangwu was yesterday.’

Added to these, Liu (1996:229–230) further points out that, in examples like (47a and b), the *bi* phrase not only provides a downward entailing environment to license the negative polarity item but also shows the anti-additive effect (Ladusaw, 1979; Pinkal, 1989).

- (47) a. Zhuzi kaihua bi Zhangsan zhan-guo ban-di jiu geng keneng occur  
Bamboo blossom than Zhangsan touch-ASP half-drop wine more possible fasheng.  
‘That bamboos blossom occurs more often than that Zhangsan drinks any wine.’  
b. Zhangsan bi Lisi huo Wangwu haiyao gao.  
Zhangsan than Lisi or Wangwu even more tall  
i. ‘Zhangsan is taller than Lisi AND Wangwu.’  
ii. ‘Zhangsan is taller than Lisi OR Wangwu.’

So Liu (1996:229–23) suggests that the *bi* phrase and the degree adverb *geng* ‘even more’ form a unit that functions like a generalized quantifier over degree and undergoes quantifier raising (i.e., QR) at LF (Ladusaw, 1979; Pinkal, 1989; Larson and May, 1990; Moltmann, 1992).

With these assumptions, the reconstruction of phonetic value for the elided site in examples like (48a), as Liu (1996) suggests, can be treated as a case similar to the QR solution to ACD problems, as (48b) illustrates (Larson, 1988; May, 1985).

- (48) a. Zhangsan jintian [<sub>I</sub> [<sub>PP</sub> bi [Lisi zuotian [<sub>I</sub> \_\_\_\_]]] kaixin.  
Zhangsan today than Lisi yesterday happy  
‘Today Zhangsan is happier than Lisi was yesterday.’  
b. [<sub>PP</sub> bi [Lisi zuotian [<sub>I</sub> t kaixin]]]<sub>i</sub> [Zhangsan jintian [<sub>I</sub> t<sub>i</sub> kaixin]].

However, as Xiang (2005), Erlewine (2007) and Lin (2009:7) point out, the clausal analysis proposed by Liu (1996) is not without problems. First, Liu (1996) has difficulties in explaining why English allows a comparative with comparative subdeletion like (49a), where the main clause and the *than* clause are both full clauses. But its Chinese counterpart (49b) is ungrammatical.

- (49) a. This desk is wider than that table is (\*two inches) long.  
b. \*[<sub>IP</sub> Zhe-zhang shuzhuo [<sub>AP</sub> [bi na-zhang zhuozhi (liang-cun) chang] kuan]]  
This-CL desk than that-CL desk two-inch long wide

Moreover, clausal analyses, including those of Cheng (1966), Hashimoto (1966, 1971), Fu (1978), and Liu (1996), also fail to explain why (50) is ungrammatical.

- (50) \*Zhangsan shuxue [bi Lisi wuli] xihuan.  
 Zhangsan mathematics than Lisi physics like  
 ‘Zhangsan likes mathematics more than Lisi likes physics.’

Still another problem which the clausal analysis needs to deal with is why the relative order among the standard constituents in examples with more than one standard constituent, as the contrast between (26a) and (26b–d) shows, has to be in the canonical ‘subject-temporal adjunct-locative adjunct(-pre-predicate adjunct)’ order.

### 3.2. The phrasal analyses

The impossibility of comparative subdeletion in the Chinese *bi* comparative leads studies like Xiang (2005), Erlewine (2007), and Lin (2009) to consider Beck et al.’s (2004) and Kennedy’s (2007) parametric study on comparatives in natural languages.

Kennedy (2007) assumes with Beck et al. (2004) that the impossibility of comparative subdeletion in Japanese indicates that Japanese does not allow standards to be degree abstraction structures, while the possibility of comparative subdeletion in English indicates that English allows this. This typological distinction in making comparison, as Kennedy (2007:149) suggests, can be described as follows:

- (51) a. Complex standards in Japanese are (only) type *e*.  
 b. Complex standards in English are (potentially) type *d*.

Although this distinction could be due to Beck et al.’s (2004) Degree Abstraction Parameter (i.e., DAP), Kennedy (2007) suggests that it could also result from a difference in the semantics of the comparative morphology in the two languages: whether the language selects a standard of type *e* or type *d* (i.e., whether it expresses individual or degree comparison).

Assuming this way to account for the impossibility of comparative subdeletion in Japanese, Kennedy (2007) points out that the semantics of the comparative morpheme MORE<sub>D</sub> that he gives in (52) for the English comparative will not work for Japanese if standards are always individual denoting in Japanese, because it expects a standard of type *d*.

- (52)  $[[\text{MORE}_D]] = \lambda d \lambda g \in D_{\langle d, \langle e, t \rangle \rangle} \lambda x. \max\{d' \mid g(d')(x) = 1\} > d$

In spite of this, there is strong evidence that (52) is not the only option even in English. As noted originally by Hankamer (1973), English standards may be either degree abstraction structures or simple DPs; that is, there exists a ‘phrasal’ versus a ‘clausal’ distinction in English comparatives, as illustrated by the contrast below (Hoeksema, 1983; Heim, 1985; Kennedy, 1999).

- (53) a. Kim doesn’t know who<sub>1</sub> Lee is taller [<sub>PP</sub> than t<sub>1</sub>]  
 b. \*Kim doesn’t know who<sub>1</sub> Lee is taller [<sub>PP</sub> than [<sub>CP</sub> t<sub>1</sub> is]]

Namely, the fact that we can extract the interrogative word *who* in (53a) suggests that it is the complement of a preposition rather than the subject of an embedded *wh*-construction, as in the ungrammatical (53b).

Thus, Kennedy (2007:150) hypothesizes two lexical entries for the explicit comparative morpheme MORE: one with the denotation in (52), which expresses degree comparison, and the other with the denotation in (54), which expresses individual comparison (Hoeksema, 1983; Heim, 1985; Kennedy, 1999; Bhatt and Takahashi, 2007).

- (54)  $[[\text{MORE}_I]] = \lambda y \lambda g \lambda x. \max\{d' \mid g(d')(x) = 1\} > \max\{d'' \mid g(d'')(y) = 1\}$

That is, both individual comparison and degree comparison have the same core meaning (i.e., encoding asymmetric ordering relations between arbitrary degrees, and introducing interpretations that are independent of the semantics of the positive form), but differ in the semantic type of their standards. On the one hand, individual comparison involves a syntactic standard of type *e*, and derives a standard degree by applying the meaning of the gradable adjective to this individual; on the other hand, degree comparison expects a syntactic standard that is already type *d*.

Relevant here, in Chinese as in Japanese, comparative subdeletion is impossible. So Kennedy (2007:152) assumes with Xiang (2005) that Chinese has only individual comparison, while English has both types. This assumption then entails a corresponding difference in the syntactic expression of standard arguments: Standard arguments in Chinese would have to be individual denoting expressions, while standards in English could denote either individuals or degrees.

Along the line developed by Kennedy (2007), Lin (2009) proposes a phrasal analysis to the Chinese *bi* comparative by making the following three assumptions to generate the syntactic structure and its corresponding semantic interpretation. First, the Chinese *bi* comparative is a phrasal rather than a clausal comparative; that is, it does not have degree comparison in syntax (Beck et al., 2004:325; Kennedy, 2007).



Second, the word *bi* is a dyadic comparative degree word that might take one or more than one argument, either individuals, times, locations, instruments, or even propositions, as long as they are arguments of the predicate of comparison. This assumption, as Lin (2009:17–18) argues, predicts that adjuncts, like manner adverbs or reason clauses, cannot be the comparable constituent.

Third, the phrase headed by the degree word *bi* is an adjunct degree phrase adjoined to the left of the predicate of comparison.

Assuming these, Lin (2009) gives example (55a) a syntactic structure like (55b), in which the degree word *bi* ‘than’ takes three arguments (i.e., the individual argument *Lisi*, the time argument *jintian* ‘today’, and the location argument *zai jiali* ‘at home’) and must be flanked by constituents of the same type. And the whole DegP-shell headed by the degree word *bi* ‘than’ occurs as an adjunct degree phrase adjoined to the predicate of comparison (Tsao, 1990).

- (55) a. Zhangsan zuotian zai xuexiao bi Lisi jintian zai jiali kaixin.  
Zhangsan yesterday at school than Lisi today at home happy  
‘Zhangsan was happier yesterday at school than Lisi is at home today.’
- b. [<sub>S</sub> Zhangsan [<sub>AP</sub> [<sub>NP</sub> zuotian] [<sub>AP</sub> [<sub>PP</sub> zai xuexiao] [<sub>AP</sub> [<sub>DegP</sub> bi [<sub>DegP</sub> [<sub>NP</sub> Lisi] [<sub>Deg</sub> [<sub>Deg</sub> t<sub>i</sub>] [<sub>DegP</sub> [<sub>NP</sub> jintian] [<sub>Deg</sub> [<sub>Deg</sub> t<sub>i</sub>] [<sub>PP</sub> at jiali] [<sub>AP</sub> kaixin]]]]]]]]]]]]].

Semantically, the degree word *bi* ‘than’ with a denotation like (56), as Lin (2009) suggests, has a semantic function similar to what Heim’s (1985) direct analysis does for the English comparative morpheme *-er*.

- (56)  $\|bill\| = (\lambda I)^i(\lambda i)^j(\lambda w)^k\lambda x\lambda P_{\langle d, \langle I \rangle, \langle i \rangle, \langle e \rangle, \langle e, t \rangle \rangle \rangle}(\lambda I')^i(\lambda i')^j(\lambda z)^k\lambda y$   
 $[t_{\max} d [P(d)(I')(i')(z)(y)] > t_{\max} d [P(d)(I)(i)(w)(x)]]$

Highly influential though Lin’s (2009) analysis is, it still encounters some problems. First, assuming that Chinese is a dyadic argument comparison language and that only arguments of the predicate of comparison can be the standard constituents, Lin (2009) would expect (57a and b), where two reason clauses are compared with each other, to be ungrammatical, but the fact does not bear out this expectation.<sup>16</sup> (Example (57b) was provided by one of the anonymous reviewers.)

- (57) a. Mama yinwei Xiaoming<sub>i</sub> shuo huang bi baba yinwei ta<sub>i</sub> tou dongxi  
Mother because Xiaoming<sub>i</sub> say lie than father because he steal thing  
haiyao shengqi.  
even angry  
‘His<sub>i</sub> mother gets angry more because Xiaoming<sub>i</sub> lies than his<sub>i</sub> father gets angry because he<sub>i</sub> steals things.’
- b. Laoban yinwei ta jingchang chidao bi yinwei ta ou'er fan  
Boss because he often late than because he sometimes make  
cuo hai geng shengqi.  
mistake even more angry  
‘The boss is even more angry because he is often late than because he sometimes makes mistakes.’

Second, even though all the standard constituents in (58) are arguments of the predicate of comparison *xihuan* ‘like’, this example, which takes the preposed postverbal object NP of the verb *xihuan* ‘like’ (i.e., *wuli* ‘physics’) as one of the standard constituents, is unexpectedly ill-formed.

- (58) \*Zhangsan shuxue bi Lisi wuli xihuan.  
Zhangsan mathematics than Lisi physics like  
‘Zhangsan likes mathematics more than Lisi likes physics.’

<sup>16</sup> One anonymous reviewer reminds me that s/he checked some native speakers about (57a and b), and all the native speakers checked say that (57a) is understandable but unnatural and (57b) provided by one anonymous reviewer is even worse than (57a). I have checked intuitions of twenty-three native speakers for these two sentences. All of them accept (57a) as a natural, understandable and grammatical sentence, and (57b) sounds marginal to nine of them but understandable and grammatical to others. As the anonymous reviewer further points out, Lin’s (2009) analysis can cover example (57a and b) by making one of the following two adjustments. One is to assume that it is somehow true that referential expressions or arguments, but not non-referential adjuncts, can be more easily compared. However, if so, the argument- versus non-argument-dependent parameter of comparison proposed by Lin (2009) will be challenged. The other is to adjust Lin’s (2009) semantics of *bi* by adding one more argument with an appropriate semantic type – the type of a reason clause. However, this raises the question of what cannot be an argument.

Third, Lin (2009, 23) requires the comparative degree word *bi* to be flanked by standard constituents and their semantically/syntactically corresponding correlates (Tsao, 1990). However, as (59a and b) show, such is not necessarily required.<sup>17</sup> (See also footnote 3.)

- (59) a. Xianzai wo erzi bi yiqian guai-duo le.  
Now I son than before well-behaved-more SFP  
'Now my son is more well-behaved than before.'
- b. Zai xuexiao xuesheng zongshi bi zai jiali tinghua.  
At school student always than at home well-behaved  
'Students are more well-behaved in school than at home.'

Still further, in a Chinese pivotal construction like (60a), the pivotal verb *rang* 'let', as Tang (2010:184–187) suggests, selects a VP as complement. And (60a) is very difficult to analyze as one with a syntactic structure like (60b), where the predicate *zhu san-tian* 'live three-day' takes the sentence *wo rang ni* 'I let you' as subject.

- (60) a. Wo [<sub>VP</sub> [<sub>V</sub> rang [<sub>VP</sub> ni [<sub>V</sub> zhu san-tian]]]].  
I let you live three-day  
'I let you live here for three days.'
- b. [<sub>S</sub> [<sub>S</sub> Wo rang ni] [<sub>VP</sub> zhu san-tian]].  
I let you live three-day

Given this, Lin's (2009) analysis is challenged by (61a) with a structure like (61b), because, under his analysis, the degree word *bi* takes the non-argumental pivotal verb *rang* 'let' as argument.

- (61) a. Wo rang ni [bi ni rang ta] duo zhu-le san-tian.  
I let you than you let he many live-ASP three-day  
'I let you stay for three more days than you let me.'
- b. Wo rang ni [<sub>VP</sub> [<sub>DegP</sub> bi<sub>i</sub> [<sub>DegP</sub> [<sub>NP</sub> ni] [<sub>Deg'</sub> [<sub>Deg</sub> t<sub>i</sub>] [<sub>DegP</sub> [<sub>v</sub> rang] [<sub>Deg'</sub> [<sub>Deg</sub> t<sub>i</sub>]]]]]] [<sub>VP</sub> duo zhu-le san-tian]]  
I let you than let  
[<sub>NP</sub> ta]]]]] [<sub>VP</sub> duo zhu-le san-tian]]  
he many live-ASP three-day

As we have seen, neither a pure clausal nor a pure non-clausal analysis can well adequately explain the syntactic and semantic properties of Chinese *bi* comparatives. In what follows, I provide evidence to show that a hybrid analysis might successfully account for *bi* comparatives.

#### 4. The proposal

I start constructing a hybrid analysis by distinguishing the Chinese *bi* comparatives that contain more than one standard constituent from those containing one standard constituent in terms of the following property: in the former, the standard constituent cannot be a preposed postverbal object of the main verb from which the predicate providing the dimension of comparison (or containing the element that provides the dimension of comparison) is projected; however, this restriction does not hold in the latter.

<sup>17</sup> One might say Lin (2009) can get out of this problem by assuming that the temporal adverb *xianzai* 'now' in (59a) is moved from a position adjacent to the *bi* phrase *bi yiqian* 'than before' to sentence-initial position, as (i) shows.

- (i) Xianzai; wo erzi t<sub>i</sub> bi yiqian guai-duo le.  
Now I son than before well-behaved-much SFP  
'Now my son is more well-behaved than before.'

However, this raises the question of why (ii), in which the NP *gou* 'dog' is moved from the position adjacent to the *bi* phrase *bi mao* 'than cat', is ungrammatical.

- (ii) \*Gou<sub>i</sub> Zhangsan t<sub>i</sub> bi mao xihuan.  
Dog Zhangsan than cat like  
'Zhangsan likes dogs more than cats.'

Significantly here, this distinction leads us to analyze examples like (62), which involves the Chinese long *bei* passive construction, as one containing more than one standard constituent.

- (62) Zhangsan<sub>i</sub> bei ta<sub>i</sub>-de mama [bi Lisi<sub>j</sub> bei ta<sub>j</sub>-de baba] da-de geng qican.  
 Zhangsan BEI his mother than Lisi BEI his father hit-DE more pitiful  
 ‘Zhangsan<sub>i</sub> was beaten more pitifully by his<sub>i</sub> mother than Lisi<sub>j</sub> was beaten by his<sub>j</sub> father.’

According to Huang et al. (2009:137), a Chinese long *bei* passive construction like (63a) has a syntactic structure like (63b), in which the main verb *bei* selects a complement clause which undergoes null-operator movement and type-shifts into a property predicated on the experiencer subject (i.e., *Zhangsan*); that is, the verb *bei* and the *bei* NP (i.e., the agent NP *Lisi*, as the coordination test in (63c) shows, do not form a constituent (Huang, 1999; Huang et al., 2009:117).

- (63) a. Zhangsan bei Lisi da-le.  
 Zhangsan BEI Lisi hit-ASP  
 ‘Zhangsan was hit by Lisi.’  
 b. Zhangsan bei [<sub>IP</sub> Op<sub>i</sub> [<sub>IP</sub> Lisi [<sub>VP</sub> da-le t<sub>i</sub>]]].  
 Zhangsan BEI Lisi hit-ASP  
 ‘Zhangsan was hit by Lisi.’  
 c. (?)Ta bei Lisi ma-le liang-sheng, Wangwu ti-le san-xia.  
 He BEI Lisi scold-ASP two-CL Wangwu kick-ASP three-time  
 ‘He was scolded twice by Lisi and kicked three times by Wangwu.’

Instead, the agent NP (i.e., *Lisi*) forms a clausal constituent with the VP that follows it, to the exclusion of the preceding *bei*. Assuming Huang et al.’s (2009) analysis to the Chinese long *bei* passive construction, I suggest that (62) has a syntactic structure like (64), which involves comparative ellipsis and a degree operator-variable binding relation in syntax, because the verb *bei* following *Lisi* has to take a clause rather than an NP as complement.

- (64) [Zhangsan<sub>i</sub> [bei [ta<sub>i</sub>-de mama [[Op<sub>k</sub> [bi [Lisi<sub>j</sub> bei [<sub>IP</sub> ta<sub>j</sub>-de baba ~~da-de~~ t<sub>k</sub> can]]]]]] [da-de geng can]]]]].  
 Zhangsan BEI his mother than Lisi BEI his father hit-DE  
 pitiful hit-DE more pitiful

One anonymous reviewer reminds me of example (65a and b) taken from Shi (2006), and says that Huang et al.’s (2009) analysis to the Chinese *bei* passive might not be correct.

- (65) a. Zhengfu cong Shanghai diaolai-le yaowu, Beijing diaolai-le  
 Government from Shanghai transfer-ASP medicine Beijing transfer-ASP  
 zhangpeng.  
 tent  
 ‘The government transferred medicine from Shanghai and tents from Beijing.’  
 b. Yi huir, zhe meimiao-de shengyin bei shu, bei cao, bei yi-ge  
 A while the beautiful voice BEI tree BEI grass BEI one-CL  
guangmo de kongjian tunshi.  
 spacious DE space swallow  
 ‘In a while, the beautiful voice has been swallowed by trees, by grass and by a wide space.’

As the reviewer notes, on the one hand, the second *bei* in (63c), perhaps just like the second preposition *cong* ‘from’ in (65a), is simply deleted later in the derivation. However, treating the marker *bei* as a preposition, as Shi (2006:327) himself points out, would force us to analyze (66) as a structure involving preposition stranding.

- (66) Zhangsan bei da-de hen can.  
 Zhangsan BEI beat-DE very pitiful  
 ‘Zhangsan was pitifully beaten.’

But, (66) is unexpectedly perfect in grammaticality. On the other hand, (65b), where three ‘*bei* agent’ sequences are coordinated with one another, implies that the marker *bei* and the agent NP might form a constituent. However, in addition

to analyzing (65b) in a way as what Shi (2006) suggests, this sentence can also be analyzed as a shared constituent coordination construction as the English sentence (67a and b) are (Radford, 1988:77–78).

- (67) a. I fixed and my mother painted the chair you bought yesterday.  
 b. I consider John and believe him to be a genius.

In (67a and b), what are shared (i.e., *the chair you bought yesterday* in (67a) and *to be a genius* in (67b)) are constituents, but what are not are not (i.e., *I fixed* and *my mother painted* in (67a) and *I consider John* and *believe him* in (67b) are not constituents). So, like (67b), (65b) can be analyzed as a shared constituent coordination construction with a syntactic structure where the verb *bei* takes a complement clause and the predicate *tunshi* 'swallow' is shared by the three 'bei agent' sequences. And, these three 'bei agent' sequences are not syntactic constituents.

#### 4.1. The hybrid analysis

Judging from the above, I propose a hybrid analysis for the *bi* comparatives with the following four assumptions: First, I analyze examples containing only one standard constituent as the *bi* phrasal comparative and those containing more than one standard constituent as the *bi* clausal comparative.

Second, similar to the prepositional subordinator *yin(wei)* 'because' in selection, the marker *bi* is a prepositional subordinator taking as complement a (non-)clausal constituent, and forms with it a pre-predicate adjunct phrase (i.e., the *bi* phrase).

- (68) a. Zhangsan shichang [yinwei [<sub>S</sub> Lisi queke]] er shengqi.  
 Zhangsan often because Lisi absent then angry  
 'Zhangsan often gets angry because Lisi is absent.'  
 b. Zhangsan [yinwei [<sub>NP</sub> ni]] cai mei lai.  
 Zhangsan because you then not come  
 'Because of you, Zhangsan did not come here.'  
 c. Zhangsan [yinwei [<sub>PP</sub> dui ni]] cai hui zheme keqi.  
 Zhangsan because to you then will so polite  
 'Because of you, Zhangsan becomes so polite.'

Not carrying the meaning of comparison denoted by the English comparative morpheme *-er*, the marker *bi*, on the one hand, functions to introduce only one standard constituent in a contrastive relation to its correlate in the *bi* phrasal comparative, and this constituent cannot involve comparative deletion. On the other hand, a clause containing more than one standard constituent in a contrastive relation to its corresponding main clause correlates is introduced in the *bi* clausal comparative. And this clause obligatorily involves comparative deletion in syntax. This way of dividing the *bi* comparatives into phrase versus clausal comparatives is exemplified in (69a and b), respectively.

- (69) a. Zhangsan bi Lisi kaixin.  
 Zhangsan than Lisi happy  
 'Zhangsan is happier than Lisi.'  
 b. Zhangsan jintian [bi [Lisi zuotian kaixin]] (geng) kaixin.  
 Zhangsan today than Lisi yesterday happy (even-more) happy  
 'Today Zhangsan is even happier than Lisi was yesterday.'

One anonymous reviewer questions this assumption by asking why the deletion operation in (69b) differs from other deletion operations in not being optional. As is well known, comparative deletion in natural languages differs from other deletion operations, for example, VP deletion or gapping, in that the former is obligatory while the latter is optional (Lees, 1961; Bresnan, 1973, 1977; Sag, 1976; Chomsky, 1977).

- (70) a. The galaxy contains more stars than the eye can see (\*stars).  
 b. At that time, sea level was not as high as it later became (\*high).  
 c. My sister drives as carefully as I drive (\*carefully).  
 (71) a. John will buy a car, and Bill will (buy a car), too.  
 b. John bought a book, and Bill (bought) a magazine.

Thus, the optionality shown by other deletion operations cannot be used as evidence to argue against the existence of comparative deletion in examples like (69b).

Furthermore, the ungrammaticality of (72a), where the identical predicate *kaixin* 'happy' in the complement clause of the marker *bi* is not deleted, not only shows that comparative deletion must be distinguished from other deletion operations in Chinese (e.g., VP deletion in (72b)) but also provides evidence in support of the assumption that examples like (69b) involve comparative deletion.<sup>18</sup>

- (72) a. \*Zhangsan jintian [bi [Lisi zuotian kaixin]] (geng) kaixin.  
Zhangsan today than Lisi yesterday happy even-more happy  
b. Zhangsan hui qu meigo, Lisi ye hui (qu meiguo). (VP deletion)  
Zhangsan will go America Lisi also will go America  
'Zhangsan will go to America, and Lisi will (go to America), too.'

Although backward deletion, as one anonymous reviewer points out, is involved in (69b), the grammaticality of (73a and b) clearly indicates that backward deletion is not impossible in Chinese, especially in constructions with a subordinated structure.

- (73) a. Yinwei ni ye yao ~~qu~~, suoyi wo cai yao qu.  
Because you also will go so I then will go  
'Because you will go, so I will go.'  
b. Yinwei ni ye keyi ~~liu-xialai~~, suoyi ta cai keyi liu xialai.  
Because you also can stay down-come so he then can stay down-come  
'Because you also can stay here, so he can stay here too.'

Moreover, I suggest that all the subelements of the complement clause of the marker *bi* except those in a contrastive relation to their corresponding correlates have to be 'elided' by comparative deletion in the *bi* clausal comparative, and the 'elided' site, though not having to be properly governed by a (functional) head with strong agreement, must be **e-given** (Merchant, 2004).<sup>19</sup>

- (74) The Focus Condition on Ellipsis (Merchant, 2001, 2004)  
A constituent  $\alpha$  can be elided if  $\alpha$  is *e-given*.  
a. *e-given*: An expression X is *e-given* iff X has a salient antecedent A and, modulo existential type-shifting, (i)  $\alpha$  entails F-clo(X), and (ii) X entails F-clo(A).  
b. The F-closure of  $\alpha$  (F-clo( $\alpha$ )) is the result of replacing all F-marked subelements of  $\alpha$  with variables of the appropriate type.

In addition to fulfilling *e-giveness*, the 'salient' antecedent of the elided site must be as minimal as possible. So it has to consist only of (A) a degree variable, and (B) a minimal predicate that can form with the standard constituents a clause the same

<sup>18</sup> So deletion involved in the *bi* comparative that contains only one standard constituent should not be considered as a type of comparative deletion because deletion in this type of *bi* comparative, as (28a–c) show, is optional.

<sup>19</sup> As one anonymous reviewer points out, a head licenser like *shi* 'is' might occur inside the complement clause of the prepositional subordinator *bi*, as (i) shows.

- (i) Zhangsan xianzai bi Lisi yiqian shi gao-le yixie.  
Zhangsan now than Lisi past IS tall-ASP a-little-bit  
'Now Zhangsan IS a little bit taller than Lisi was.'

However, the following two facts show that the copular verb *shi* 'is' in (i) actually belongs to the main clause rather than the complement clause of the prepositional subordinator *bi*. First, as (ii) shows, between *yiqian* 'past' and *shi* 'is', we can insert the degree adverb *geng* 'even more', which functions to modify the main predicate of the *bi* comparatives.

- (ii) Zhangsan xianzai bi Lisi yiqian geng shi gao-le yixie.  
Zhangsan now than Lisi past even-more IS tall-ASP a-little-bit  
'Now Zhangsan is even a little bit taller than Lisi was.'

Second, the sequence *bi Lisi yiqian* 'than Lisi past' can be deleted with the copular verb *shi* 'is' left, as (iii) illustrates.

- (iii) Zhangsan xianzai shi gao-le yixie.  
Zhangsan now IS tall-ASP a-little-bit  
'Now Zhangsan is a little bit taller.'

In addition to these two points, if the verb *shi* 'is' indeed can occur as a head licenser in the complement clause of the marker *bi*, then example (iv) is expected to be grammatical, contrary to fact.

- (iv) \*Zhangsan xianzai bi Lisi yiqian shi gao.  
Zhangsan now than Lisi past is tall

as (or parallel to) the minimal clause containing the *bi* phrase in the basic sentence type. Assuming these, in (75a) the 'salient' antecedent that the elided site retrieves from the main clause, which contains the emphatic marker *haiyao* 'even' modifying the degree adverb *geng* 'even-more', is *da-de x-hao* 'play-DE x-good', which happens to be the same as that of the elided site in (75b).

- (75) a. Zhangsan lanqiu [bi [Lisi paiqiu]] da-de haiyao geng  
Zhangsan basketball than Lisi volleyball play-DE even even-more  
hao.  
good
- b. Zhangsan lanqiu han paiqiu [bi [Lisi yumaoqiu]] da-de dou  
Zhangsan basketball and volleyball than Lisi badminton play-DE all  
geng hao.  
Even-more good  
'Zhangsan plays basketball and volleyball better than Lisi plays badminton.'

The assumption that an elided site only has to be *e*-given but does not need to be licensed by a head with strong agreement gets supporting evidence from examples like (76), where the elided VP in the second conjunctive clause does not need any head licenser.<sup>20</sup>

- (76) Zhangsan jintian chufa, Lisi mingtian [<sub>VP</sub> ~~chufa~~].  
Zhangsan today leave Lisi tomorrow  
'Zhangsan leaves today, but Lisi tomorrow.'

Third, in the spirit of Paul's (1993) (cyclic) *c*-command condition which works only on phrasal comparatives, I suggest that the notion of *c*-command plays an important role in building the *bi* comparatives.<sup>21</sup> In the *bi* phrasal comparative, the

<sup>20</sup> According to Lobeck's (1995:51–52) condition on licensing and identification of *pro*, an empty, non-arbitrary pronominal must be properly head-governed, and governed by an  $X^0$  specified for strong agreement, and an  $X^0$  is specified for 'strong' agreement iff  $X^0$ , or the phrase or head with which  $X^0$  agrees, morphologically realizes agreement in a productive number of cases. Given this, one might suggest that, in Chinese, an empty pronominal (or an elided site) must be properly head-governed by an  $X^0$  specified for strong agreement because of examples like (i) and (ii).

- (i) Zhangsan hui bang ni, Lisi ye \*(hui).  
Zhangsan will help you Lisi also will  
'Zhangsan will help you, and Lisi will, too.'
- (ii) Zhangsan hen congming, Lisi ye \*(shi).  
Zhangsan very smart Lisi also is  
'Zhangsan is very smart, and Lisi is, too'

Namely, the obligatory occurrence of an auxiliary like *hui* 'will' or *shi* 'is' seems to imply that licensing by an  $X^0$  specified for strong agreement is necessarily required for an elided site in Chinese. If so, the elliptical analysis I propose for the *bi* clausal comparative will be challenged. However, the assumption that an elided site must be licensed by  $X^0$  specified for strong agreement is still unclear, at least, in Chinese for the following two reasons. First, it is widely accepted that Chinese does not have agreement morphology. Second, in Chinese the conjunctive adverb *ye* 'also' has to co-occur with an overt verbal predicate, and the occurrence of the auxiliary in (i)-(ii) might function to license the occurrence of the conjunctive adverb *ye* 'also' rather than the elided site.

<sup>21</sup> Paul (1993:17–18) establishes a structural requirement to regulate the relationship between the two terms of comparison (i.e., X and Y) in the schema of (i). The essence of her analysis is that the X in (i) must *c*-command or cyclically *c*-command the Y, as defined below.

- (i) X comparative word Y (adverb) dimension
- (ii) For a, b nodes in a tree, a *c*-commands b iff every branching node dominating a dominates b, and neither a nor b dominates the other.
- (iii) a cyclically *c*-commands b iff:
- a *c*-commands b, or
  - if g is the minimal cyclic node (NP or S') that dominates a, then g *c*-commands b.

As pointed out by Paul (1993:19), the cyclic *c*-command condition is required in order to rule in examples like (iv).

- (iv) We-de shu bi ni duo.  
I-DE book than you many  
'I have more books than you.'

As she argues, the modifier *wo* 'I' in the first term of comparison cyclically *c*-commands the standard of comparison *ni* 'you'. So, (iv) is grammatical. See Shi (2001:144–145) for further discussion.

standard constituent chooses as correlate the minimal c-commanding constituent parallel in category and semantics, and the standard constituent must be parallel to its correlate in the grammatical function at the semantic level. In the *bi* clausal comparative, the complement clause of the marker *bi* must be parallel to the minimal clause containing the *bi* phrase in basic syntactic structure. And the standard constituents in *bi* clausal comparatives must be minimally c-commanded by their corresponding correlates, and be parallel to them in category, semantics and syntax.<sup>22,23</sup> The parallelism requirement, to which the *bi* clausal comparative is subject, correctly rules out examples like (77a and b), which contain (two) embedded standard constituents (e.g., *Wangwu* and *zuotian* ‘yesterday’ in (77a)), because the minimal clause containing the *bi* phrase in (77a) (i.e., the main clause *Zhangsan jintian kaixin* ‘Zhangsan today happy’) is not parallel to the complement clause of the marker *bi* (i.e., *Lisi renwei Wangwu zuotian kaixin* ‘Lisi think Wangwu yesterday happy’) in the syntactic structure.<sup>24</sup>

- (77) a. \*Zhangsan jintian [bi [Lisi renwei [Wangwu zuotian ~~kaixin~~]] kaixin.  
Zhangsan today than Lisi think Wangwu yesterday happy happy

<sup>22</sup> One anonymous reviewer wonders why there is a minimal c-commanding condition behind the requirement, saying this syntactic condition sounds ‘stipulative’ by pointing out that the minimal c-command condition is most often used in anaphoric binding where a PRO/pro is looking for a possible antecedent. However, it is not the case that the minimal c-command condition is only used in anaphoric binding. In addition to anaphors, elements like negative polarity items, which need to be bound by a negation(-like) marker/operator, are also subject to some version of the minimal c-command condition. In a comparing event, two compared degrees or entities are required. Let us say one is the standard and the other the correlate. The standard needs to look for a correlate to make the comparison possible. To reduce the computational complexity, it is not implausible for us to say that the standard needs to search its correlate in some local domain. Following this line of reasoning, it should not be considered ‘stipulative’ to require a standard constituent to choose as its correlate the minimal c-commanding constituent parallel in category and semantics.

<sup>23</sup> One anonymous reviewer wonders what forces the parallel requirement between the standard constituent and its correlate in category, semantics, and syntax. And can it be derived from some general principle? The parallelism between the standard constituent and its correlate in category, semantics and syntax in fact is the realization of the general principle of logical reasoning as we can see in establishing a minimal pair. To identify two sound segments as different phonemes, we need to establish a minimal pair for them, in which two forms with distinct meanings that differ by only one segment are found in the same position in each form. Likewise, to compare a standard constituent and its correlate and show they only differ by the degree along some dimension, we need to establish a ‘minimal pair’ for them, in which ‘other’ syntactic and semantic properties relevant to the standard constituent and the correlate are expected to be parallel/the same to each other as the two segments in a minimal pair are expected to be the same in position. So the parallelism between the standard constituent and the correlate can be derived from the basic principle of logical reasoning rather than a pre-description of the fact. In addition, one might wonder why the clause parallel to the complement clause of the marker *bi* in the basic sentence type must be the minimal clause containing the *bi* phrase. This requirement can be considered as one manifestation of the locality effect shown by the two parallel constituents. Besides, one might wonder why the parallelism requirement does not exist between the complement clause of the marker *than* and the minimal clause containing the *than* phrase in the English *than* clausal comparative, as (i) shows.

- (i) John is taller [than [Bill thinks that Jack is]].

This might result from the difference between the marker *bi* and *than* in the richness of lexical meaning. Although the prepositional subordinator *bi* is grammaticalized from the verb *bi* with the lexical meaning of comparing, it is still quite concrete and rich in lexical meaning nowadays. However, the meaning of *than* has become so bleached that it is difficult to get any concrete meaning from it. Perhaps it is this distinction that makes *than* have less restriction on its complement in the c-selection and the s-selection than *bi*.

<sup>24</sup> One might wonder why examples containing a long *bei* passive construction like (i) seemingly allow an embedded standard (i.e., *ta-de baba* ‘he-DE father’).

- (i) [Zhangsan<sub>i</sub> [bei [ta<sub>i</sub>-de mama [[Op<sub>k</sub> [bi [Lisi<sub>j</sub> bei [IP ta<sub>j</sub>-de baba da-de t<sub>k</sub>  
Zhangsan BEI his mother than Lisi BEI his father hit-DE  
can]]]] [da-de geng can]]]]].  
pitiful hit-DE more pitiful

According to Huang et al. (2009:120–123), a long *bei* passive construction like (ii) with a syntactic structure as in (iii) has a semantic representation like (iv), in which the propositional (i.e., IP) argument has been turned into a predicate by null operator movement. This predicate represented by the lambda-abstracted expression  $\lambda x$  [*Lisi da-le x*] ‘ $\lambda x$  [Lisi hit-ASP x]’ is equivalent to an intransitive predicate, where exactly one argument position is unsaturated.

- (ii) Zhangsan bei Lisi da-le.  
Zhangsan BEI Lisi hit-ASP  
‘Zhangsan was hit by Lisi.’  
(iii) [IP Zhangsan [VP bei [IP Op<sub>i</sub> [IP Lisi da-le t<sub>i</sub>]]]].  
(iv) Zhangsan<sub>x</sub> bei  $\lambda x$  [Lisi da-le x]

Assuming this, the syntactic structure of example (i) can be represented as in (v), in which the verb *bei* in the complement clause of the marker *bi* forms a complex predicate with the predicate  $\lambda y$  [IP *ta-de baba da-de y can*] ‘ $\lambda y$  [IP his father hit-DE y pitiful]’ in the complement clause of the marker *bi*.

- (v) [Zhangsan<sub>x</sub> [bei  $\lambda x$  [IP ta-de mama [[bi [Lisi<sub>y</sub> bei  $\lambda y$  [IP ta-de baba da-de y  
Zhangsan BEI his mother than Lisi BEI his father hit-DE  
can]]]] [da-de x geng can]]]]].  
pitiful hit-DE more pitiful

So the minimal clause containing the *bi* phrase in (v) is the minimal clause containing the complex predicate formed by the verb *bei* and the predicate  $\lambda x$  [IP *ta-de mama da-de x geng can*] ‘he-DE mother hit-DE even-more pitiful’. Hence, the parallelism requirement is not violated in examples like (i).

- b. \*Zhangsan renwei [Lisi jintian [bi [Wangwu yiwei [Zhaoliu zuotian Zhangsan think Lisi today than Wangwu think Zhaoliu yesterday ~~kaixin~~]]] kaixin].

Fourth, instead of providing the meaning of comparison denoted by the English comparative *-er* morpheme, the word *bi* simply functions to introduce the standard constituent(s) as the English *than* does. Given this, I suggest that Chinese has a covert comparative morpheme. This covert comparative morpheme, however, differs from the English comparative morpheme *-er* in semantics, as shown by the contrast below (Shi, 2001:137; Liu, 2010b).

- (78) a. Zhangsan bi Lisi ~~geng~~ gao.  
Zhangsan than Lisi tall  
'Zhangsan is taller than Lisi, and it is not necessary for Lisi to be tall.'
- b. John is taller than Bill (is).

Namely, the covert comparative morpheme ~~geng~~, as the interpretation of (78a) indicates, does not presuppose that Lisi is tall, but the English comparative morpheme *-er* as in (78b) presupposes that Bill is tall. Given these, following Heim's (1985) theory of comparatives, I give the covert comparative morpheme ~~geng~~ a denotation like (79a) when it occurs in a *bi* phrasal comparative, but a denotation like (79b), where the symbol  $\approx$  indicates that the Chinese covert comparative morpheme does not presuppose that the properties of the compared 'objects' are true in the absolute sense, when it occurs in a *bi* clausal comparative.<sup>25</sup>

- (79) a.  $\| \text{geng} \langle a, b \rangle \|$  is true iff  $f(a) > f(b)$ .  
b.  $\| \text{geng} \langle P_{\langle d, t \rangle}, Q_{\langle d, t \rangle} \rangle \|$  is true iff the maximal  $d$  s.t.  $Q(d) \approx 1 >$  the maximal  $d$  s.t.  $P(d) \approx 1$ .

All in all, the hybrid analysis proposed can be clearly exemplified by (80a), which, containing only one standard constituent, is a *bi* phrasal comparative, and (80b), which, containing more than one standard constituent, is a *bi* clausal comparative.

- (80) a. [<sub>S</sub> [<sub>NP</sub> Zhangsan] [<sub>DegP</sub> [bi [<sub>NP</sub> Lisi]]] [<sub>DegP</sub> [<sub>AP</sub> kaixin]]].  
'Zhangsan is happier than Lisi.'
- b. [<sub>S</sub> Zhangsan [jintian zai jiali [<sub>CP</sub> Op<sub>i</sub> [<sub>C</sub> [c bi] [<sub>S</sub> Lisi zuotian zai xuexiao [<sub>DegPE</sub> [<sub>Deg</sub> X<sub>i</sub>] [<sub>AP</sub> ~~kaixin~~]]]]]]] [<sub>DegPA</sub> kaixin]]].  
'Today Zhangsan is happier at home than Lisi was yesterday in school.'

On the one hand, the prepositional subordinator *bi* in (80a) introduces its complement NP *Lisi* as the standard constituent, and this standard constituent chooses as correlate the minimally *c*-commanding constituent parallel in category and semantics (i.e., *Zhangsan*). So, neither comparative deletion nor degree comparison is involved. And what are compared with respect to the dimension of happiness are the two individuals: *Zhangsan* and *Lisi*. Assuming Heim's (1985) direct analysis to the semantics of the phrasal comparative, the semantic interpretation of (80a) can be represented as in (81a).

- (81) a.  $\| \text{geng} \langle \text{Zhangsan}, \text{Lisi} \rangle \lambda x \lambda y [x \text{ is } y\text{-kaixin}] \| = 1$  iff  
 $\lambda x \lambda y [x \text{ is } y\text{-kaixin}] (\text{Zhangsan}) > \lambda x \lambda y [x \text{ is } y\text{-kaixin}] (\text{Lisi})$  iff  
 $\lambda y [\text{Zhangsan is } y\text{-kaixin}] > \lambda y [\text{Lisi is } y\text{-kaixin}]$
- b.  $\| \text{geng} \langle (\lambda d. \text{KAIXIN}(\text{Zhangsan}) \geq / < d), (\lambda d. \text{KAIXIN}(\text{Lisi}) \geq / < d) \rangle \| = 1$  iff  
 $\lambda y [\text{Zhangsan is } y\text{-kaixin at home}] > \lambda y [\text{Lisi was } y\text{-kaixin in school}]$

On the other hand, example (80b) is treated as a *bi* clausal comparative, where the adjunct phrase (i.e., the *bi* phrase) formed by the prepositional subordinator *bi* and its complement clause (i.e., *Lisi zuotian zai xuexiao x<sub>i</sub> kaixin* 'Lisi yesterday at school x<sub>i</sub> happy') is adjoined to the main predicate *kaixin* 'happy'. And the complement clause of the marker *bi* obligatorily involves comparative deletion and a degree operator-variable binding relation in syntax.<sup>26</sup> As the semantic interpretation of (80b) (i.e., (81b)) indicates, what are compared with each other in syntax are the maximal degree associated with the matrix predicate *kaixin* 'happy' and the maximal degree associated with the embedded predicate *kaixin* 'happy'. Besides, as (82a and b) indicate,  $\text{DegPA}'$  in (80b) entails  $F\text{-clo}(\text{DegPE}')$ .  $\text{DegPE}'$  in (80b) also entails  $F\text{-clo}(\text{DegPA})$ .

<sup>25</sup> Following Heim's (1985) direct analysis to phrasal comparatives, I assume that a phrasal comparative does not involve a comparison between two degrees but rather a comparison between two individuals with respect to a certain dimension. Besides, dimensions are analyzed as functions (i.e.,  $f$  in (79a)) from individuals  $x$  to degrees  $y$  and can be represented by a lambda-iota expression " $\lambda x \lambda y [\dots x \dots y \dots]$ ", which takes an argument and returns a maximal degree.

<sup>26</sup> I leave it as an open question whether the *bi* clause in (80b) (i.e., *bi Lisi zuotian zai xuexiao kaixin* 'than Lisi yesterday at school happy') is a CP or a clause smaller than a CP.



- (82) a.  $\text{DegP}_A' = \lambda x \exists d.[x \text{ d-kaixin}]$   
 b.  $\text{F-clo}(\text{DegP}_E') = \lambda x \exists d.[x \text{ d-kaixin}]$

So the embedded  $\text{DegP}_E$  (i.e., *d-kaixin* 'd-happy') in (80b) is *e*-given, and (80b) is grammatical.

#### 4.2. Further evidence for the hybrid analysis

To add to the evidence from examples containing the long *bei* passive construction, I now provide two further pieces of evidences for the assumption that the *bi* comparative with more than one standard constituent is a clausal comparative. The first piece comes from examples like (83), which contains the *ba* disposal construction.

- (83) Zhangsan ba qian bi ba shengming kan-de zhong.  
 Zhangsan BA money than BA life regard-DE important  
 'Zhangsan regards money as more important than (he does) life.'

According to Whitman and Paul (2005), Li (2006:412), and Huang et al. (2009:195), a *ba* disposal construction like (84a) has a syntactic structure like (84b), in which the verb *ba* selects as complement a light verb phrase, as the coordination test in (83c) illustrates.

- (84) a. Zhangsan ba qian kan-de zhong.  
 Zhangsan BA money regard important  
 'Zhangsan regards money as important.'  
 b. [Zhangsan<sub>i</sub> [<sub>baP</sub> t<sub>i</sub> [<sub>ba'</sub> ba [<sub>VP</sub> qian [<sub>V'</sub> v [<sub>VP</sub> kan-de zhong]]]]]]].  
 c. Zhangsan ba yiqi kan-de zhong, jinqian kan-de qing.  
 Zhangsan BA personal-loyalty look-DE important money look-DE belittle  
 'Zhangsan has personal loyalty overrated, but money belittled.'

The grammaticality of (84c) provides us strong evidence to give (83) a syntactic structure as in (85), where the marker *bi* 'than' selects as complement a clause containing a *ba* phrase with an elided predicate (i.e., *kan-de zhong* 'regard-DE important').<sup>27</sup>

- (85) Zhangsan<sub>i</sub> ba qian [Op<sub>j</sub> [bi Pro<sub>i</sub> [<sub>baP</sub> [<sub>ba'</sub> ba [<sub>VP</sub> shengming [<sub>VP</sub> ~~kan-de~~  
 Zhangsan BA money than BA life regard-DE  
~~t<sub>j</sub>-zhong~~]]]]]]] kan-de zhong.  
 important regard-DE important

<sup>27</sup> As one anonymous reviewer points out, the remark made for (65a) also applies to the *ba* construction. Namely, the second *ba* in (84c), perhaps just like the second preposition *cong* 'from' in (65a), repeated as (i), is simply deleted later in the derivation.

- (i) Zhengfu cong Shanghai diaolai-le yaowu, Beijing diaolai-le zhangpeng.  
 Government from Shanghai transfer-ASP medicine Beijing transfer-ASP tent  
 'The government transferred medicine from Shanghai and tents from Beijing.'

However, treating the marker *ba* as a preposition, as Whitman and Paul (2005) argue, leads to the following difficulties. First, the behavior of *ba* in (84c) contrasts sharply with (ii), where a true adjunct PP is involved.

- (ii) Wo [dui Wangwu] hen you yijian, [\* (dui) Laoli] ye hen you yijian.  
 I to Wangwu very have prejudice to Laoli also very have prejudice  
 'I am very prejudiced against Wangwu, and also against Laoli.'

That is, (ii) is totally ungrammatical without the second occurrence of the preposition *dui* 'to'. Second, if the marker *ba* is a preposition, we would expect the PP headed by it could be topicalized to the left of the subject as PPs can. However, as the contrast below indicates, the fact does not bear out this expectation.

- (iii) Gei Mali, wo zuo-le hundun tang, gei Amei, wo zuo-le chaomian.  
 For Mary I make-ASP wonton soup for Amei I make-ASP tried-noodle  
 'For Mary, I made wonton soup; for Amei, fried noodles.'  
 (iv) (\*Ba shu), ni keyi fang zai zhuozi-shang, (\*ba dayi), ni keyi fang zai chuang-shang.  
 BA book you can put at table-top BA coat you can put at bed-top  
 'The books, you can put on the table; the coat, you can put on the bed.'

Second, the ungrammaticality of (86a), where a further syntactic focus movement has the postverbal object NP of the verb *xihuan* ‘like’ (i.e., *wuli* ‘physics’) preposed to a preverbal position, provides another piece of evidence for the assumption that a Chinese *bi* comparative with more than one standard constituent is a clausal comparative.

- (86) a. \*Zhangsan (xianzai) shuxue<sub>i</sub> [[bi [Lisi (yiqian) wuli<sub>j</sub> ~~xihuan t<sub>j</sub>~~] xihuan t<sub>i</sub>].  
 Zhangsan now mathematics than Lisi past physics like like  
 ‘Zhangsan likes mathematics more than Lisi liked physics.’
- b. Zhangsan xianzai shuxue<sub>i</sub> [[<sub>CP</sub> Op<sub>j</sub> [<sub>C</sub> [<sub>C</sub> bi] [Lisi yiqian  
<sub>FocP</sub> wuli<sub>k</sub> [<sub>OPF</sub> [<sub>DegP</sub> [<sub>Deg</sub> \*<sub>j</sub>] [<sub>AP</sub> ~~xihuan t<sub>k</sub>~~]]]]]]] xihuan t<sub>i</sub>].

As the syntactic structure of (86a) in (86b) shows, the degree operator and the focalized phrase *wuli* ‘physics’ both involve the focus semantic value because both of them can denote a set of alternatives. However, they still differ from each other in that the focus phrase further involves the ordinary semantic value contributed by the focus operator. Significantly here, the degree variable in (86b) is c-commanded by the focus operator; therefore, the focus operator will wrongly reset the focus semantic value of the degree variable and the trace of the focalized phrase to the ordinary semantic value. This resetting process leave the degree operator with nothing to bind. So, (86a), violating the focus intervention effect, is ungrammatical (Beck, 2006). The focus intervention effect shown by examples like (86a) provides another piece of evidence for assuming that the Chinese *bi* comparative with more than one standard constituent is a clausal comparative.<sup>28</sup> (Along the same line of reasoning, the ungrammaticality of (26b–d) can also be handily explained.)

#### 4.3. Implications of the hybrid analysis

The hybrid analysis proposed has the following welcome implications and predictions. First, the minimal c-commanding condition between the standard constituent and its correlate interacts with the pre-predicate adjunct status of the *bi* phrase to make the standard constituent *shen* ‘deep’ in (87) not have a correlate.

- (87) \*Zhe-tiao he xianzai [bi [na-tiao he guoqu shen]] kuan.  
 This-CL river now than that-CL river past deep wide  
 ‘This river is wider than that one was deep.’

This not only explains why comparative subdeletion is not allowed in the *bi* clausal comparative, but also implies that the lack of comparative subdeletion does not necessarily entail the lack of clausal comparatives and degree comparison in a language (Beck et al., 2004; Kennedy, 2007).<sup>29</sup>

Second, on my analysis, the examples in (88) are all treated as the *bi* phrasal comparative, where only one standard constituent is contained and no comparative deletion is involved.

<sup>28</sup> As one anonymous reviewer points out to me, the ungrammaticality of (i), which does not contain a degree operator-variable relation under my analysis, might indicate that the ungrammaticality of (86a) cannot be used as evidence for the clausal analysis of examples like (86a).

- (i) \*[[Zhangsan zhiyou jintian kaixin de] chengdu] [bi [[Lisi zhiyou zuotian  
 Zhangsan only today happy DE degree than Lisi only yesterday  
 kaixin de] chengdu]] hai geng gao.  
 happy DE degree still more high  
 ‘The degree to which Zhangsan is happy only today is higher than the degree to which Lisi was happy only yesterday.’

Example (i), though not containing a degree operator-variable relation, indeed involves an adjunct relative clause, which, as Ning (1993:124–134) as well as Aoun and Li (2003:172–179) convincingly argues, involves an operator-variable relation. So, the occurrence of the focus adverb *zhiyou* ‘only’ in (i) induces the focus intervention effect. Hence, instead of being a counterevidence to my analysis, the ungrammaticality of (i) provides another supporting piece of evidence for my analysis.

<sup>29</sup> One anonymous reviewer provides example (i) to challenge my account for the lack of comparative subdeletion in the *bi* clausal comparative.

- (i) Ta xianzai pang-de [bi [wo yiqian]] hai geng pang.  
 He now fat-DE than I before even-more even-more fat  
 ‘He is now fatter than I was fat before.’

As the reviewer says, the first *pang* ‘fat’ does c-command what is contained within the *bi* phrase. However, this sentence cannot be a problem for my analysis. According to my analysis, (i) has a syntactic structure like (ii).

- (ii) Ta xianzai pang-de [bi [wo yiqian pang de x pang]] hai geng pang.  
 He now fat-DE than I before fat-DE x-fat even-more more fat

The crucial point here is that the third *pang* ‘fat’ in (ii) (i.e., the one underlined) cannot have a corresponding c-commanding correlate though the second one has one.

- (88) a. Zhangsan bi Lisi kaixin. (individual)  
Zhangsan than Lisi happy  
'Zhangsan is happier than Lisi.'
- b. Zhangsan jintian bi zuotian kaixin. (time)  
Zhangsan today than yesterday happy  
'Today Zhangsan is happier than Lisi was yesterday.'
- c. Zhangsan zai xuexiao bi zai jiali tinghua. (location)  
Zhangsan at school than at home obedient  
'Zhangsan is more obedient in school than Lisi is at home.'
- d. Zhangsan yong chazi bi yong kuaizi shoulian. (instrument)  
Zhangsan use fork than use chopstick skilled  
'Zhangsan is more skilled in using forks than using chopsticks.'
- e. Beigao yinwei fan du hui bi yinwei qiangjie er geng  
Accused because sell drugs will than because rob then even-more  
youkeneng bei pan zhong xing.  
possible BEI judge severe penalty  
'It is more possible for the accused to be given a severe penalty because he sold drugs than because he robbed.'
- f. Ni qu bi wo qu heshi. (proposition)  
You go than I go appropriate  
'It is more appropriate for you to go than for me to go.'

The grammaticality of (88a–f) leads us to revise Lin's (2009) claim on the category of standard of comparison as follows: The standard of comparison in the *bi* phrasal comparative can be individuals, times, locations, instruments, propositions, or even reasons (Heim, 1985; Beck et al., 2004; Kennedy, 2007). Thus, adjuncts like reason clauses can also be compared constituents. The semantics of the *bi* phrasal comparative can be generated by Heim's (1985) direct analysis to phrasal comparatives. As Heim (1985) suggests, the general meaning of *-er* can be specified as (89) and what are compared in the phrasal comparative, for example, can be two individuals.

- (89) “*-er* <a, b > f” is true iff  $f(a) > f(b)$ .

So a function from individuals to degrees which can be represented by a lambda-iota expression “ $\lambda x.\iota y[. . . x . . . y . . .]$ ” (i.e., *f* in (89)) is needed. This implies that what are compared in the phrasal comparatives are preferred to be elements that do not carry degrees along some dimension by themselves; otherwise, the function of *f* in (89) will be nullified. More importantly, in *bi* comparatives, the dimension of comparison is provided by the predicate modified by the degree adverbs with comparison meaning like *geng* ‘even-more’. Given these, if compared (or standard) constituents are gradable by themselves (i.e., elements that can be modified by a degree adverb), the dimension provided by compared constituents and that provided by the predicate of comparison will conflict with each other. So we would expect example (90a–c) to be ungrammatical, and the facts bear out this expectation.

- (90) a. \*Zhangsan [jingchangde [[bi ou'erde] [guanxin ta]]].  
Zhangsan often than sometimes care-about he
- b. \*Zhangsan [gongkaide [[bi sidixiade]] [geng hui shuo ren huai hua]].  
Zhangsan in-public than in-private more able say people bad word
- c. \*Zhangsan [zhenxinde [[bi zhenchengde] [guanxin ni]]].  
Zhangsan sincerely than genuinely care-for you

As (91a–c) show, the temporal adverb *jingchangde* ‘often’ and manner adverbs like *gongkaide* ‘publicly’ and *zhenxinde* ‘sincerely’ are all gradable because they can be modified by a degree adverb.

- (91) a. Zhangsan hui gengjia jingchangde lai tanwang ni.  
Zhangsan will even-more often come visit you  
'Zhangsan will even more often visit you.'

- b. Zhangsan geng gongkaide piping ni.  
Zhangsan even-more in-public criticize you  
'Zhangsan even more publicly criticizes you.'
- c. Zhangsan geng zhenxinde guanhuai ni.  
Zhangsan even-more sincerely care-about you  
'Zhangsan even more sincerely cares about you.'

So the question of why manner adverbs and temporal adverbs like *jingchangde* 'often' cannot occur as compared constituents is satisfactorily accounted for by my analysis.

Third, assuming that the standard constituent in the *bi* phrasal comparative must choose as correlate the minimal *c*-commanding constituent parallel in category and semantics and be parallel to the correlate in the grammatical function at the semantic level, we can not only straightforwardly explain why a postverbal direct object (e.g., *gou* 'dog' in (92a)) cannot be directly compared over but also why (92b) is ungrammatical.

- (92) a. \*Zhangsan bi mao xihuan gou.  
Zhangsan than cat like dog  
'Zhangsan<sub>i</sub> likes dogs more than he<sub>i</sub> likes cats.'
- b. \*Gou, Zhangsan bi mao xihuan.  
Dog Zhangsan than cat like  
'Zhangsan<sub>i</sub> likes dogs more than he<sub>i</sub> likes cats.'

On one hand, the minimal *c*-commanding constituent semantically parallel to the individual-denoting standard constituent *mao* 'cat' in (92a) is *Zhangsan* rather than the postverbal object *gou* 'dog'. So, (92a), where the postverbal direct object is directly compared over, is correctly ruled out. On the other hand, in (92b), the minimal *c*-commanding constituent parallel to the individual-denoting standard constituent *mao* 'cat' in category and semantics is *Zhangsan* rather than *gou* 'dog'. Given this, the reading with *gou* 'dog' and *mao* 'cat' as objects and terms of comparison (i.e., Zhangsan<sub>i</sub> likes dogs more than he<sub>i</sub> likes cats) is impossible. Hence, (92b) with the intended reading is unacceptable. Added to these, the fact that it is not necessary for the marker *bi* to be flanked by the standard constituent and its correlate, as shown by (93a and b), is also a result welcome by the minimal *c*-commanding requirement.

- (93) a. Xianzai wo erzi bi yiqian guai-duo le.  
Now I son than before well-behaved-more SFP  
'Now my son is more well-behaved than before.'
- b. Zai xuexiao xuesheng zongshi bi zai jia-li tinghua.  
At school student always than at home-inside well-behaved  
'Students are always more well-behaved in school than at home.'

## 5. Concluding remarks

In this paper, I have argued that a hybrid analysis might hold most successfully account for the syntax and semantics of the Chinese *bi* comparative. The lack of comparative subdeletion in the *bi* clausal comparative indeed results from the interaction between the following two conditions which building a *bi* comparative is subject to: (A) the *bi* phrase occurs as an adjunct phrase adjoined to the left of the predicate of comparison, and (B) the correlate(s) must minimally *c*-command the corresponding standard constituent(s). Although these conditions seem to look 'small', interactions among these 'small' properties already have them projected as 'large' syntactic differences between the Chinese *bi* and the English *than* comparatives.

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