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## The Predicate Argument Structure of Bei\*

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### 1. Chinese bei sentences

In Chinese there is a sentence pattern in a sequence of NP<sub>1</sub> + bei + NP<sub>2</sub> + V, which often paraphrases sentences with the same verb and NPs but in a sequence of NP<sub>2</sub> + V + NP<sub>1</sub>.

- (1) a. xuesheng jiao le laoshi de toufa.      b. laoshi de toufa bei xuesheng jiao le.  
 students cut asp teacher poss. hair      teacher poss. hair bei students cut asp  
 'The students cut the teacher's hair.'      'The teacher's hair was cut by the students.'
- (2) a. Laoban jiang le Lisi de gongzi.      b. Lisi de gongzi bei Laoban jiang le.  
 boss cut-down asp Lisi poss. salary      Lisi poss salary bei boss cut-down asp  
 'The boss cut down Lisi's salary.'      'Lisi's salary was cut down by the boss.'

As shown in their translations, the above examples seem to parallel their English counterparts-- the pairs of active v.s. passive sentences. Linguists have tried to account for the relation between sentences in each pair by proposing a transformation rule (Chomsky(1957)), NP-move (Chomsky(1981&1982)), or a lexical rule (Bresnan(1982)).

In spite of the difference among these approaches to passives, they have something in common: a verb has to be transitive to be passivizable. This hallmark of passivization makes us consider *bei* sentences as anything but passives, since the main verbs in *bei* sentences are not necessarily transitive, for example

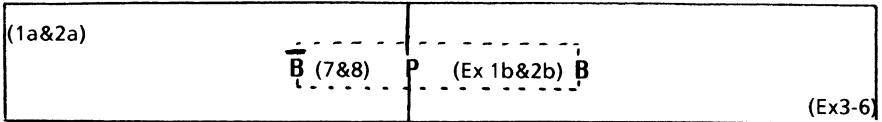
- (3) xianglian bei ta pao diao le san ke zhuzi  
 necklace bei she/her run drop asp three class. bead  
 'The necklace dropped three beads because of her running.'
- (4) wo bei ta ku de hen shangxin      (5) Liang zhi jiao bei zou chu le pao.  
 I bei he/him cry comp very sad      two class. foot bei walk appear asp blister  
 'I was saddened by his crying.'      'Two feet got blisters because of walking.'
- (6) tongwu bei ta kesou de mei fa shuijiao.  
 roommate bei he/him cough comp no way sleep  
 'His; roommate could not sleep because of his; coughing.'

Moreover, the passive meaning can be conveyed in sentences without *bei* phrases, for examples

- (7) laoshide toufa jiao le.      (8) Lisi de gongzi jiang le.  
 teacher's hair cut asp      Lisi's salary cut-down asp  
 'The teacher's hair was cut.'      'Lisi's salary was cut down.'

The following figure may serve as an illustration of the relation among P(assive), B(ei), and  $\bar{B}$ (without *bei* phrases) sentences

(9)



## 2. The problems with considering bei as the matrix verb

Ma(1985) considers *bei* sentences not analogous to English passives, the latter but not the former conforming to Bresnan's(1982) generalization of the nature of passivization (10).

(10) Passivization (SUBJ) --->(OBL)/Ø (OBJ) --->(SUBJ)

Ma's arguments are 1) NP<sub>2</sub> (in NP<sub>1</sub> bei NP<sub>2</sub> V) is not oblique;(The reason is that if *bei* were a preposition, a *bei* sentence without an overt NP<sub>2</sub> such as (11)a&b would be ruled out, since objects of PP's are never null elsewhere.

- (11) a. laoshi de toufa bei e jiao le.      b. Lisi de gongzi bei e jiang le.  
 teacher poss. hair bei e cut asp.      Lisi poss salary bei e cut-down asp  
 'The teacher's hair was cut.'      'Lisi's salary was cut down.'

Yet (11)a-b are perfect. Therefore, *bei* must not be a preposition and if *bei* is not a preposition, NP<sub>2</sub> cannot be oblique, since all other obliques are always accompanied by a preposition or postposition.)<sup>1</sup> 2) NP<sub>2</sub> has properties of SUBJ in Chinese: it can control XADJ's as in (12)b and bind a reflexive *ziji* 'self' as in (13)b, while no other non-subject NPs can<sup>2</sup>. The examples she gives are

- (12) a. Laotan guang-zhe-jiao bei Malizi ti-si le.(Ma(1985) (13)a)  
 Laotan barefoot bei Malizi kick-die asp  
 'Laotan, barefoot, was kicked to death by Malizi.'

- b. Laotan bei Malizi guang-zhe-jiao ti-si le. (Ma(1985) (13)b)  
 Laotan bei Malizi barefoot kick-die asp  
 'Laotan was kicked to death by Malizi who was barefoot.'

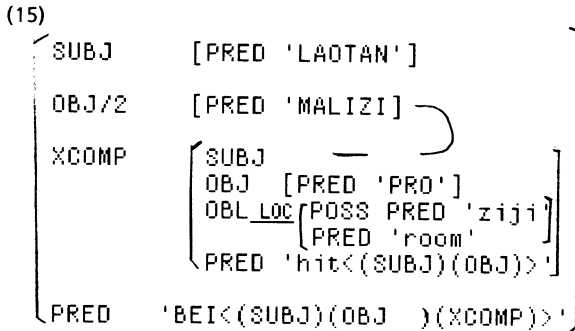
- (13) a. Laotan<sub>i</sub> gei Malizi<sub>j</sub> ziji<sub>i/\*j</sub> de xiangpian.(Ma(1985) (18))  
 Laotan give Malizi self poss picture  
 'Laotan gave Malizi pictures of her( = Laotan's).'

- b. Laotan<sub>i</sub> bei Malizi<sub>j</sub> zai ziji<sub>i/j</sub> de fangjianli da le.(Ma(1985) (22))  
 Laotan<sub>i</sub> bei Malizi<sub>j</sub> loc. self poss room beat asp  
 'Laotan<sub>i</sub> was beaten by Malizi<sub>j</sub> in her *i/j* room.'

Ma(1985) attributes these properties of NP<sub>2</sub> to its control over an empty pronominal subject of the open complement subcategorized by *bei*. Based on these characteristics of NP<sub>2</sub>, she proposes that Chinese *bei* has the lexical form like this

(14) bei V (↑ PRED) = 'bei < (↑ SUBJ)(↑ OBJ)(↑ XCOMP)>'  
 (↑ XCOMP SUBJ) = (↑ OBJ)

Thus the f-structures of (13)b is (15).



The cooccurrence of *bei* with intransitive verbs in sentences like (4-6) supports identifying *bei* as a verb instead of an oblique marker like the English *by* or a passive morpheme like the English *-en*.

However, even with this justification of identifying *bei* as a verb, it is quite dubious that *bei* has this lexical form, because *bei* does not parallel other verbs with the same argument structure as (14): while all sentences whose main verbs have the argument structure like (14), can be rearranged in certain ways, *bei* sentences cannot. The following three rearranging processes obligatorily or optionally apply to sentences with the argument structure 'V<(↑SUBJ)(↑OBJ)(↑XCOMP)>': 1) the objects can be topicalized by preceding their dominating S's as in (16)b; 2) the objects can be 'prefixed' by *ba* and preposed between the SUBJ and the verb, as in (16)c; 3) the objects with a universal quantifier but in the form of a *wh*-word must be preposed to get the reading of a universal quantifier and, meanwhile, the verb should be preceded by *dou* 'all', as in (17)b&c. Take the verb *rang* 'let' for example, it has the lexical form: *rang* 'let<(↑SUBJ)(↑OBJ)(↑XCOMP)>' exactly the same as (14). Sentences with *rang* as their main verb can undergo all of the three rearranging processes mentioned above.

- (16) a. ta rang xiaohair jin wu.      b. xiaohair, ta rang jin wu.  
       he let child enter house      child he let enter house  
 'He let children enter his house.'    'Children, he let them enter his house.'
- c. ta ba-xiaohair rang jin wu.  
       he ba-child let enter house  
 'He let children enter his house.'
- (17) a. ta rang meigeren jin wu.      b. ta shui dou rang jin wu. (c.f. b')  
       he let everybody enter house      he WHO all let enter house  
 'He let everybody enter his house.'    'He let everybody enter his house.'
- b'. ta dou rang shui jin wu.      c. shui, ta dou rang jin wu.  
       he all let who enter house      WHO he all let enter house  
 'Who did he let enter his room?'      'He let everybody enter his house.'

If *bei* had the same argument structure as *rang* 'let' does, all these changes that the object of 'let' underwent would be applicable to 'the object of *bei*' without causing any ungrammaticality, which is unfortunately not the case.

- (18) a. *laoshi de toufa bei xueshengmen jiao le*  
 teacher poss. hair bei students cut asp  
 'The teacher's hair was cut by the students.'  
 b. \**xueshengmen, laoshi de toufa bei jiao le.*  
 students teacher poss. hair bei cut asp.(cf.(16)b.)  
 c. \**laoshi de toufa ba-xueshengmen bei jiao le*  
 teacher poss. hair ba-students bei cut asp (cf.(16)c.)  
 d. \**laoshi de toufa shui dou bei jiao le*  
 teacher poss. hair who all bei cut asp (cf.(17)b.)  
 e. \**shui laoshi de toufa dou bei jiao le.*  
 who teacher poss. hair all bei cut asp.(cf.(17)c.)

Notice that none of the changes that the object of *rang* may or must undergo is applicable to 'the object of *bei*'. This suggests that *bei* does not parallel *rang* in their lexical forms. According to (14), examples in (18) would have parallel responses to the rearranging processes with those for (16)&(17), which is not what we have found.

Another counterargument against the lexical form of *bei* (14) can be found in sentences where *bei* interacts with resultative clauses

- (19) *wo {a.ting/b.bei} ta ku de hen shangxin*  
 I {a.hear/ b.bei} he/him cry comp very sad  
 a. 'I heard him crying sadly.'      b. 'I was saddened by his crying.'  
 (20) *xuesheng {a.kan/ b.bei} laoshi jiang de keshui le.*  
 student {a.see/b.bei} teacher lecture comp sleepy asp  
 a. 'The students saw the teacher sleepily lecturing.'  
 b. 'The students were sleepy because of the teacher's lecturing.'

Notice that in a's the objects control 'sad' and 'sleepy', but in b's the subjects do instead, which would be a mystery if *bei* had the same lexical form as verbs like 'hear' or 'see' do.

### 3. Modified predicate argument structure of *bei* and the problem raised

The contrast between (16)&(17) and (18) in grammaticality seems to suggest that there is no object argument for *bei*. A modified argument structure of *bei* is

- (21) *bei* V '*bei* < (↑ SUBJ) (↑ COMP) > '.

which retains the non-passive status of *bei* sentences, but tries to explain the contrast in grammaticality between (16)&(17) and (18) by the difference of depth between the two NPs: the NP following *rang* is rearrangeable because, as the subcategorized for object of the matrix verb *rang*, its move to the topic position crosses only one bounding node S, while as the subject of the complement sentence, the NP following *bei* has to cross two S nodes to be in the topic position, given that there are certain constraints on how many bounding nodes can be crossed. However, (21) has every other problem as (14) does: 1) *Bei* sentences do not parallel other sentences whose main verbs have the same lexical form (21): the whole proposition in all those sentences can be topicalized, but not in *bei* sentences. For example,

(23) a. wo zhidao [ta zhu zai nar].      a'. ta zhu zai nar, wo zhidao.

I know he live loc. where      he live loc. where I know

'I know where he lives.'      'I know where he lives.'

b. ta zancheng [yi nian fencheng lia xueqi].

he approve one year divide two semester

'He approves that a year is divided into two semesters.'

b'. yi nian fencheng lia xueqi, ta zancheng.

one year divide two semester he approve

'He approves that a year is divided into two semesters.'

(24)a. laoshi de toufa bei [xueshengmen jiao le].

teacher poss. hair bei students cut asp

'The teacher's hair was cut by the students.'

b. \* xueshengmen jiao le, laoshi de toufa bei .

students cut asp teacher poss. hair bei

2) If we put 'know' in the substitution slots in (19-20), we'll get the same controllers for 'sad' and 'sleepy' as in sentences with 'see' and 'hear', but different from the controllers in *bei* sentences in the same triples. This also contradicts what the modified lexical form of *bei* would predict.

It seems that we have exhausted all the possible identities of the NP following *bei*: it can neither be an oblique of the passive verb marked by *bei*, nor the object of *bei* as shown in section 2, nor can it be the subject of the complement sentence as shown in this section. Then what on earth can it be?

#### 4. Reconsideration of the objecthood of NP2

We may have jumped to the conclusion that the NP following *bei* is not an object a bit too soon: there are objects of VPs with certain grammatical functions that cannot be rearranged, for example

(26)a. ta mai le che.      b. che, ta mai le.      c. ta mai che huan le zhang.

he sell asp bike      bike he sell asp      he sell bike return asp debt

'He sold the bike.'      'He sold the bike.'      'He returned the money by selling the bike.'

d. \* che, ta mai huan le zhang.      d'. zhang, ta mai che huan le .

bike he sell return asp debt      debt he sell bike return asp

(c. f. b & d')      'He returned the money by selling the bike.'

From the above examples, we notice that in a sentence like (26)a, the object which can be rearranged as in (26)b, when it is the sole object in the sentence, can no longer be rearranged when its clause joins another one which, in the combined sentence such as (26)c, follows it and shares the same subject with it.

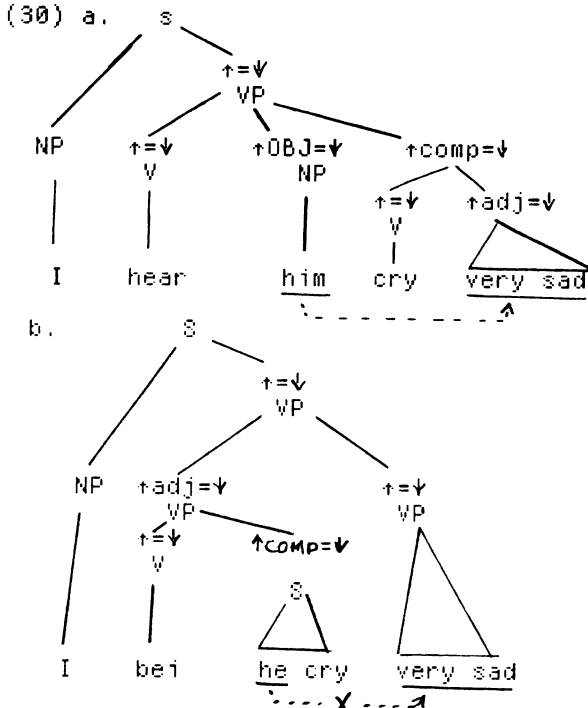
So the non-parallelism with *rang* sentences cannot falsify the objecthood of the NP following *bei*, if we can show that *bei* phrases have the same function as the first VP in (26)c does. Then, what is the annotated c-structure of (26)c? There can be 3 possibilities



b. John cursed his luck, watching TV.

b'. \*What did John curse his luck, watching?

The contrast in the controllers of 'sleepy' and 'sad' between a's and b's of (19-20) also results from this subordinate status of *bei* phrases: the a's have (30)a, but the b's have (30)b as their c-structures, respectively.



While in (30a), as an argument subcategorized for by the matrix predicate, 'him' controls 'sad', in (30b) the argument of the adjunct predicate 'he' cannot control 'sad'. Similar phenomena can be found in English as well.

(31) a. Mary expected him to be too anxious to wait.

b\* Mary, expecting him, was too anxious to wait.

#### 4.2. The dispensability of *bei* phrases

The semantic role of an adjunct is to make the meaning of the matrix predicate more specific so that the whole sentence gets, as its complete meaning, the intersection of the matrix predicate meaning and the adjunct meaning. The meaning of the sentence with the adjunct entails its counterpart without the adjunct. This is true of Chinese *bei* sentences: the *bei* phrase disambiguates the corresponding sentences without this adjunct, which usually have both the active and non-active readings:

(32)a. laoshi jiao le toufa.

teacher cut asp hair

'The teacher cut his hair.' or

'The teacher got his hair cut.'

a'. laoshi bei xueshengmen jiao le toufa.

teacher bei students cut asp hair

'(Lit.) The teacher was cut by the students at hair.'



- b. Lisi jiang le gongzi.                      b'. Lisi bei laoban jiang le gongzi  
 Lisi cut-down asp salary                      Lisi bei boss cut-down asp salary  
 'Lisi cut down his salary.' or                      '(Lit.) Lisi was cut down by the boss at salary.'  
 'Lisi had his salary cut down.'

While our proposal considers the function of *bei* phrases as an adjunct and explains its dispensability, both (14) and (21), considering *bei* as a main verb, predict that the omission of *bei* phrases would make the remaining arguments--the matrix subject and the complement object unrelated individuals and make the sentence uninterpretable. This prediction is counterargued by the well-formedness of (32)a and b.

#### 4.3 Lexical rather than structural ambiguity

As a matter of fact, of all the *bei* sentences we have talked about so far, their counterparts without *bei* phrases convey passive as well as the active reading, be *bei* followed by a null pronominal, or an overt NP, or a sentence. Without context, the following sentences are ambiguous<sup>4</sup>.

- (33) a. ji chi le naodai.                                      b. laotou kan-bu-jian le  
 chicken eat asp head                                      old-man see-not-perceive asp  
 'The chicken's head was eaten.' or                      'The old man could not see.' or  
 'The chicken ate the head (of                      'The old could not be seen.  
 the dough figure).'

Now the question is whether the ambiguity in sentences like (33) is lexical or structural. In other words, which will the better account for the ambiguity be, to consider the verbs as homonyms meaning both 'eat' and 'eaten', 'see' and 'seen', or to attribute the two readings to two different structures, i.e.

- (34)a. [<sub>S</sub> NP<sub>1</sub> V NP<sub>2</sub>]                      b. [<sub>S</sub> NP<sub>1</sub> [<sub>S</sub> pro V + NP t<sub>i</sub>]]

The difference between the two structures is to consider 'chicken' as the subject in the former, but an object preposed to the topic position in the latter. In Chinese, there is almost no way to tell a subject in situ from a topicalized object followed by a null subject, since Chinese has neither subject-verb agreement nor case marker and subjects and topicalized objects have the same response to all the rearranging tests we can think of. This time the interaction between topicalizing and embedding serves as a good test: though the objects in matrix sentences can always be topicalized as shown earlier in (16)b, the objects in the embedded clauses cannot.

- (35)a. mao chi le ji naodai. -->                      a'. mao chi le ji naodai nei jian shi.  
 cat eat asp chicken head                      cat eat asp chicken head that class. matter  
 'The cat ate the chicken's head.'                      'the fact that the cat ate the chicken's head'  
 b. ji chi le naodai. -->                      b'. ji chi le naodai nei jian shi.  
 chicken eat asp head                      chicken eat asp head that class. tice tha 'The  
 chicken's head was eaten.'                      'the fact that the chicken's head was eaten'  
 or 'The chicken ate the head.'                      or 'the fact that the chicken ate the head'  
 (36)a. ji, mao chi le naodai. -->                      a'. ??ji, mao chi le naodai nei jian shi.  
 chicken cat eat asp head                      chicken cat eat asp head that class. matter  
 'As for the chicken, the cat ate its head.'



rearranged, the coindexing of the resultative adjunct with the matrix subject, and the dispensability of *bei* phrases.

One more point about the lexical form of *bei*. In the lexicon, it should be specified that *bei* never appears as the matrix predicate unlike other transitive verbs, which can either be matrix predicates, or adjunct predicates as shown in (26). This specification does not make our account more complicated than others', since this peculiarity of *bei* has to be specified any way.

### Footnotes

\* I am indebted to Joan Bresnan, Jonni Kanerva, Lizi Ma, Bill Poser, and Michael Wescoat for their comments and what I have learned through revising the present paper with their insightful criticism in mind will benefit me in future research as well.

<sup>1</sup>As for Ma(1985) reasoning, that the object of PP is never null is confirmed in Li & Thompson(1981); but that the obliques are always accompanied by a preposition (or postposition) is questionable, for example

I. a. shui jin le yi-lou.                      a'. yi lou jin le shui.  
water enter asp 1st-floor                      1st-floor enter asp water  
'Water entered the first floor.'                      'Water entered the first floor.'

II. a. yi jian fang zhu lia ren.                      a'. lia ren zhu yi jian fang.  
one class. room live two person                      two person live one class. room  
'In one room live two persons.'                      'Two persons live in one room.'

Here 'first floor' and 'one room' are not accompanied by any preposition at all. We cannot, however, deny that they are obliques, because otherwise we would be saying that in Chinese subjects and objects may exchange.

<sup>2</sup>While it may be true that only subjects bind a reflexive, given that the reflexive is dominated by a non-branching NP, the binding of a reflexive dominated by a branching NP (the reflexive possessor) to the subject but not any non-subject as in (13b) is only an artifact of the specific verb 'give' used in (13b): the things given should always be the giver's belonging but never the recipient's. If we substitute, for 'give', other verbs such as *huangei* 'return' or *digei* 'hand', the recipient objects as well as the agent subjects can bind the reflexive possessor.

<sup>3</sup>In Huang(1982), double object constructions and constructions involving complements to 'control' verbs are sanctioned by marked features of the verbs, which require both constituents following them to be subcategorized-for elements.

<sup>4</sup>More transitives are ambiguous in voice in Chinese than not, unless thematic or pragmatic clues exclude either of the two readings.

a. Shu nian le wu bian.                      a'. Wo nian le wu bian.  
book read asp five time                      I read asp five time  
\*'The book read (it) five times.'                      'I read (it) five times.'  
'The book was read five times.'                      \*'I was read five times.'

b. Mary da le.                      b' Mary da le wo.  
Mary hit asp                      Mary hit asp me  
'Mary hit somebody.'                      'Mary hit me.'  
or 'Mary was hit.'                      \*'Mary was hit.'

