

WHAT IS THE LEXICAL FORM OF 'BEI'?

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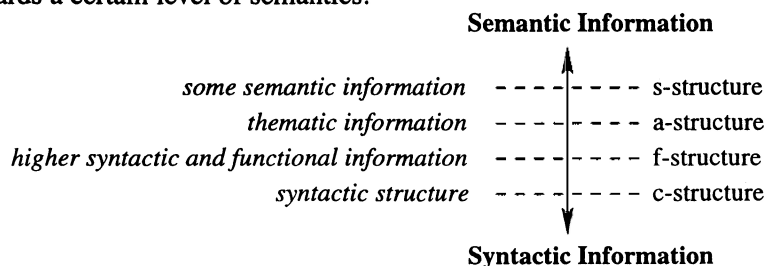
ABSTRACT

The lexical representation of the Chinese word '被' has been an issue of on-going debate. The lexical form suggested by Her seemed to provide a complete representation of the different syntactic behaviours of '被' within a Lexical-Functional Grammar (LFG) account. However, when applying this representation in conjunction with the argument structure (a-structure) and the lexical mapping theory in LFG, this representation conflicts with the lexical mapping theory. This paper examines this problem and proposes a solution to the problem when dealing with the lexical representation of '被'.

1. INTRODUCTION

The Chinese word '被' is an unusual lexical unit as it has two different linguistic behaviours (cf. Section 2). Due to this distinctive characteristic, the lexical representation of '被' has been a frequently discussed subject. The Chinese word '被' is frequently being mistaken as a preposition. However, as argued by Tan [9] and Her [7], '被' cannot be a preposition; it is indeed a verb. Tan [9] treated '被' and its following noun phrase (NP) as a subordinate clause for making the meaning of a sentence more specific. However, Her argued that Tan's argument structure of '被' is incomplete. There are some forms of '被'-sentences that Tan's argument structure failed to describe. The lexical form of '被' suggested by Her can adequately predict and explain the different syntactic behaviours of '被' in Lexical-Functional Grammar (LFG) terms. However, a problem arises when applying lexical mapping theory defined in the LFG formalism to Her's lexical form.

In LFG, different levels of linguistic information is represented by different structures: constituent structure (c-structure), functional structure (f-structure), argument structure (a-structure) and semantic structure (s-structure) [2, 3, 6]. The linguistic information encoded in these structures ranges from pure syntax towards a certain level of semantics:



Lexical mapping theory [1, 4] defines the mapping between occurrences of syntactic functions in f-structures and occurrences of thematic roles in corresponding a-structures. If both the lexical form suggested by Her and the lexical mapping theory are correct and complete, there should not be any problem in applying lexical mapping theory to this lexical form. This paper discusses what goes wrong when applying lexical mapping theory to Her's lexical form and investigates the possible solutions to this problem.

2. DIFFERENT SYNTACTIC BEHAVIOURS OF 'BEI'-SENTENCES

The Chinese word '被' has a syntactic behaviour which is unique within the Chinese language. On the one hand, '被'-sentences can act as the passive alternatives of most active sentences while again conforming with the morpholexical transformation presented by Bresnan [2]:

- (1) (OBJ) → (SUBJ)
(SUBJ) → (BY OBJ)/∅

As shown in (1), the transformation of a sentence from active voice to passive voice involves two operations¹: the object of a transitive verb in an active sentence is *raised* to the subject position, leaving the object position in the passive sentence empty; and the subject of the active sentence can either appear in the passive sentence as an oblique or be suppressed. Sentences (2) and (3) are two examples of passive '被'-sentence for the sentence '瑪莉吃了雞。' (meaning "Mary ate the chicken"). They both conform with the transformation rules in (1).

- (2) 雞 被 瑪莉 吃 了。
chicken bei Mary eat TENSE MARKER.
The chicken was eaten by Mary.
- (3) 雞 被 吃 了。
chicken bei eat TENSE MARKER.
The chicken was eaten.

On the other hand, some '被'-sentences cannot be considered as passive voice. The active reading of these sentences either cannot convey a sensible meaning or they are ungrammatical. Sentences (4) and (5) are two examples of this kind of '被'-sentences.

- (4) 貓 被 老鼠 逃 了。 [7, Page 67, 1f]
cat bei mouse escape TENSE MARKER.
The cat had the mouse run off on him.
- (5) 約翰 被 瑪莉 打破 了 花瓶。
John bei Mary break TENSE MARKER vase.
John has the vase broken by Mary.

In these sentences, the word '被' has a meaning similar to "is affected by". According to the transformation rules in (1), an intransitive verb cannot undergo the morpholexical operation 'passive'. If an intransitive verb were to undergo passive transformation, the resulting sentence would be subject-less, as there is no object to be raised to the subject position of the resulting passive sentence. The verb '逃' in (4) (meaning 'escape') is intransitive. Though there is a subject (i.e. '貓') in the '被'-sentence (4), this subject is not the theme of this 'escape' event and it is not governed by the verb '逃'. (4) cannot be considered as the passive voice of (6), as the verb '逃' is intransitive and it cannot take an object. (6) is in fact ill-formed and it does not make any sense to any Chinese speaker.

- (6) * 老鼠 逃 了 貓。
mouse escape TENSE MARKER cat.

Though the meaning of the word '被' introduces some sense of passiveness to the sentence (5), it cannot be considered as a passive sentence also as it does not conform with the passive transformation rules. According to (1), after *raising* the object of a transitive verb to the subject position in a passive sentence, the object position is then left empty. The verb '打破' (meaning 'break') is transitive. However, there is an overt object in (5). This suggests that (5) is not a normal passive sentence.

Although (4) and (5) do not conform with the passive transformation presented by Bresnan, they are grammatical in Chinese. This kind of '被'-sentences, as pointed out by Her [7], are simply not in the passive voice, but the 'affective voice'.

3. A-STRUCTURE AND LEXICAL MAPPING THEORY

An a-structure shows the participants involved in an event structure in the form of *thematic roles*. Thematic roles describe the role that each participant plays in an event. For instance, the a-structure for

¹We ignore the change of tense during the transformation as it is irrelevant to our discourse.

describing the event structure of the sentence "John broke a vase." is:

(7) break <agent theme>

where the NP "John" indicates the agent and the NP "a vase" indicates the theme of the event 'break'. The function of an a-structure is to act as a link between lexical semantics and syntactic structures [3]. The lexical mapping theory formulates some constraints on how a-structure arguments are mapped onto the syntactic functions of the corresponding sentence [1, 4]. There are four kinds of syntactic functions identified in this theory: *subject* (SUBJ), *object* (OBJ), *object_θ* (OBJ_θ) and *oblique_θ* (OBL_θ). Intuitively, as observed by Bresnan and Kanerva [1, 4], these syntactic functions can be distinguished from each other by the combination of the features [$\pm r$] and [$\pm o$]:

[$^{-r}$] SUBJ [$^{-r}$] OBJ [$^{+r}$] OBJ_θ [$^{+r}$] OBL_θ
 [$^{+o}$]

where [$\pm r$] indicates whether a syntactic function is *thematically restricted* and [$\pm o$] indicates whether a syntactic function is *objective*. Similar to the syntactic functions, some thematic roles bear some of these features intrinsically [1, 4, 8]:

[$^{-o}$] agent [$^{-r}$] theme [$^{-o}$] locative

Additional features are assigned to the thematic roles according to *default role classifications*. The highest thematic role² within an a-structure is generally assigned with the feature [$-r$], and all other roles are assigned with [$+r$] apart from those which have already been classified as [$-r$] intrinsically (e.g. the thematic role 'theme'). However, these classifications can only be applied after an a-structure has undergone all the necessary morpholexical operations. One example of the morpholexical operations is the *passive* operation. When an a-structure undergoes the passive operation (i.e. the corresponding sentence is expressed in the passive voice), the highest thematic role within the a-structure is *suppressed*. The next highest thematic role will then be assigned to the subject position of the resulting passive sentence. The mapping between each thematic role in an a-structure and the corresponding syntactic function is based on *feature matching* and the well-formedness conditions: the subject condition and function-argument bi-uniqueness [1, Page 79]. (8) shows an example of the mapping between the a-structure (7) and the passive sentence "The vase was broken by John.":

(8)	A-structure:	'break'	<agent	theme>	'by'	<agent>
	Intrinsic:		[$^{-o}$]	[$^{-r}$]		[$^{-o}$]
	Passive:	'is'	∅			
	Default:					[$^{+r}$]
	Syntactic Functions:			SUBJ		OBL _{agent}
	NPs:			The vase		John

4. THE PROBLEM

According to the lexical mapping theory, the thematic role 'agent' is marked as [$-o$], i.e. non-objective. This means that the thematic role 'agent' cannot be mapped with an objective function like *object* or *object_θ* which has been classified as [$+o$]. In the lexical form of '被' (9) suggested by Her [7], the NP occurring after '被' is classified as the object of the sentence.

(9)	被: v, 被 '<(SUBJ) (OBJ) (XCOMP)>' (OBJ PRED) ≈ GENERIC (↑ XCOMP SUBJ) = (↑ OBJ) (↑ XCOMP OBJ) ≈ (↑ SUBJ)
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The symbol '≈' indicates extension and it is sometimes referred to as overwriting or unification by default inheritance [7]. The NP following '被' is always the causer of the event, and thus it is generally considered as the agent in the sentence. When applying the lexical mapping theory to the lexical form (9), a mis-match occurs. The thematic role 'agent' which is intrinsically marked as [$-o$] cannot be mapped onto the syntactic function 'object' which is classified as [$+o$].

²The order of thematic roles expressed in an a-structure reflects the thematic hierarchy: agent > beneficiary > recipient/experiencer > instrument > theme/patient > locative [1, Page 75]. The highest thematic role within an a-structure refers to the thematic role that is in the higher position in the thematic hierarchy than all other thematic roles within the a-structure.

What causes this mis-match? If a-structure is truly the link between lexical semantics and syntactic structures, and the lexical mapping theory does govern the mapping between thematic roles and syntactic functions, the mis-match should be caused by one of the following:

1. the NP following ‘被’ is not the *agent* of a ‘被’-sentence;
2. in the lexical mapping theory, the thematic role ‘agent’ is either wrongly classified as [-o] intrinsically or it can also be classified as [+o] in some cases, or
3. the lexical form suggested by Her is, to a certain extent, wrong or overly generalised.

In the remainder of this section, we will investigate the cause of the mis-match by exploring each of the above possibilities.

4.1 Is the NP following ‘bei’ an agent?

The definition of *agent* we adopt in this paper follows the one postulated by Givón [5, Page 88]:

The agent is always a conscious participant in an event, since he is a volitional initiator of the change ...

We therefore determine whether an NP is an agent by considering whether the participant of the event represented by this NP is the *conscious initiator* of the event.

Consider the different kinds of ‘被’-sentences in the following:

- (10) 我 被 老師 處罰 了。
 I bei teacher punish TENSE MARKER.
I was punished by the teacher.
- (11) 約翰 被 瑪莉 弄斷 了 腿。
 John bei Mary break TENSE MARKER leg.
John had his leg broken by Mary.
- (12) 約翰 被 瑪莉 逃走 了。
 John bei Mary escape TENSE MARKER.
John had Mary escaped from him.

The sentence (10) is a passive form of the sentence “老師處罰了我。” (meaning “*The teacher punished me.*”). The NP ‘老師’ is the *conscious initiator* of the ‘punish’ event described in (10). Thus the NP ‘老師’ serves as the *agent* of the sentence (10). The sentence (11) can be paraphrased as either “*Mary caused John to break his leg.*” or “*John’s leg was broken by Mary.*”. Although the ownership of the NP ‘腿’ in (11) is not explicitly marked, the NP ‘腿’ is understood as the leg of John (i.e. the subject of the sentence) instead of that of Mary (i.e. the NP before the second verb in the sentence). In this ‘leg-breaking’ event, Mary is understood as the person who caused John’s leg to be broken. This means that Mary is the *conscious initiator* of this event. Thus, the NP ‘瑪莉’ in (11) is an *agent*.

The sentence (12) is not a conventional passive sentence (cf. Section 2). The first NP ‘約翰’ is not governed by the verb ‘逃走’ (meaning “*escape*”). Instead of involving directly in the ‘escape’ event described in (12), the NP ‘約翰’ indicates the participant who suffers from the consequence of this event. A general interpretation of the role taken by ‘約翰’ in this ‘escape’ event is that ‘約翰’ was the person who kept ‘瑪莉’ captive or he was the one who guarded the place where ‘瑪莉’ is confined. As a result, with the escape of ‘瑪莉’, ‘約翰’ would be the one who suffered from the consequences directly. Therefore, it is clear that ‘約翰’ is not the participant who initiated this ‘escape’ event, but the one being *affected* by it. The NP ‘瑪莉’ indicates the *conscious* participant who *initiated* and carried out the action ‘escape’. Bearing the above explanation on the role played by ‘約翰’ and ‘瑪莉’, the sentence (12) can be paraphrased as “*John is affected by the fact that Mary escaped from him.*”. Therefore, the NP ‘瑪莉’ is an agent. All of the NPs following ‘被’ in (10), (11) and (12) indicate the *conscious initiator* of each of the events described. This suggests that the NP following ‘被’ in a ‘被’-sentence is indeed the agent of the event.

4.2 Is the thematic role ‘agent’ wrongly classified as non-objective?

The intrinsic classification of thematic roles is based on the observation on the relationship between syntactic functions and the meaning of each thematic role. The thematic role ‘agent’ is classified as

non-objective (i.e. [-o]) in the lexical mapping theory because it cannot appear as an object (both direct and indirect) in a sentence:

The intrinsic classifications are a distillation of pervasive cross-linguistic generalizations about the unmarked grammatical encoding of semantic roles. Thus, cross-linguistically, the agent is canonically NOT encoded as object: in syntactically accusative languages it is the canonical subject, and in syntactically ergative languages it is a thematically restricted, non-objective function ... [1, Page 77]

If an agent were to be marked as an objective function (i.e. [+o]), it would not match with the classifications for subject because the subject function is classified as thematically non-restricted and non-objective (cf. Section 3). Furthermore, marking an agent as objective means that the thematic role 'agent' cannot appear as the subject of a sentence. This is in contradiction to the general syntactic behaviour of the thematic role 'agent' in most, if not all, languages.

The intrinsic classification of the thematic role 'agent' [-o] in the lexical mapping theory allows an agent to appear as a subject in a sentence. This syntactic behaviour of an agent is generally true in many languages. However, according to Her, there are other verbs in Chinese which have the same complement structure and control relations as those in (9), e.g. '受', '捱', '歸', '該' and '輪到':

- (13) 我 受 老師 教導。 [7, Page 78, 3a]
I receive teacher teach.
I receive the teacher's teaching.
- (14) 我 捱 爸爸 罵。 [7, Page 78, 3b]
I receive papa scold.
I was scolded by papa.
- (15) 盤子 歸/該/輪到 你 洗。 [7, Page 78, 3c]
dish take-turns you wash.
It's your turn to wash the dishes.

These verbs might have the complement structure and control relations suggested by Her, the NPs following them are not the agents of the events described by them. For instance, (13) described a 'receive' event, where the participant who initiated this receiving action is '我'. The object that underwent the receiving action is '老師教導' (meaning "teacher's teaching"). The agent of this 'receive' event is '我'. The NP '老師' in (13) is NOT the agent of this 'receive' event, but the agent of the 'teach' sub-event embedded in this sentence. Same applies to the sentences (14) and (15). This suggests that assigning the thematic role 'agent' to the object position of a sentence is also NOT common in Chinese. Therefore, assigning the feature [-o] to the thematic role 'agent' intrinsically seems to be the most suitable choice.

4.3 Is the lexical form suggested by Her wrong or overly generalised?

As was discussed in the previous section, the thematic role 'agent' is seldom, or never, mapped with the syntactic function 'object'. Her's lexical form of '被' seems to ignore this property. Her dismissed the possibility of treating '被' as a subject marker by pointing out that though a semantic agent is often being treated as the subject of a sentence, '被'-sentences are not [O S V]-type sentences. However, this does not support the argument that a semantic agent can appear in a sentence as an object. If the NP following '被' is genuinely the object of a '被'-sentence, '被' should be a transitive verb. It is universal across languages that a transitive verb takes an object. However, as illustrated in Section 2 (3), a '被'-sentence can be 'object'-less. To get over this problem, Her introduced a default assignment of a 'generic' value to '被'-sentences. If a '被'-sentence has an overt 'object', the generic value will be overridden by this overt 'object'; otherwise, the 'object' position will be filled with this generic value. Although Her cited that the Chinese words '受', '捱', '歸', '該' and '輪到' have the same control relation, to fill an object position with a default generic value is not common in Chinese and in other languages.

Her claimed that the verbs '歸', '該' and '輪到' have the same control relations as '被'. This is not entirely correct. The NP following '被' can be omitted without affecting the grammatical correctness of a '被'-sentence. This does not apply to sentences with '歸', '該' and '輪到':

- (16) * 盤子 歸/輪到 洗。
dish take-turn wash.

- (17) ? 盤子 該 洗。
dish should wash.
The dishes should be washed.

The omission of the NP following '歸', '該' and '輪到' either causes the sentence to be ungrammatical or changes the meaning of the sentence. This suggests that the assignment of a generic value to sentences with these verbs is wrong.

The object position of the sentences with the verbs '受' and '捱' can be left empty:

- (18) 我 受 教導。 [7, Page 78, 3a]
I receive teach.
I receive teaching.
- (19) 我 捱 罵。 [7, Page 78, 3b]
I receive scold.
I was scolded.

This does not cause the sentence to be ungrammatical or the meaning of the sentence to change. The same syntactic behaviour is found in the passive '被'-sentence (3). However, for the affective '被'-sentences (4) and (5), if the NP following '被' is not overt, they sound odd:

- (20) ? 貓 被 逃 了。
cat bei escape TENSE MARKER.
- (21) ? 約翰 被 打破 了 花瓶。
John bei break TENSE MARKER vase.
? John has the vase broken.

Both sentences (20) and (21) are not readily understandable by average Chinese speakers. To improve the readability of these sentences, an NP is required to be inserted after '被' in each case. This raises the question as to whether these sentences are grammatical. According to Her's lexical form of '被' shown in (9), if the NP after '被' is not overt, its value is set to 'generic'. If it is appropriate to assign a generic value to the affective '被'-sentences like (4) and (5), the sentences (20) and (21) should be acceptable. However, (20) and (21) do not convey a sensible meaning and would more likely to be considered as ill-formed by average native Chinese speakers.

Another difference between the two kinds of '被'-sentences (i.e. the passive voice sentences (2) and (3) versus the affective voice sentences (4) and (5)) is that if the NP following '被' is not overt, the passive reading of a sentence does not necessarily require the presence of the verb '被'. For example, both (22) and (23) have similar passive meaning:

- (22) 一 本 書 被 約翰 送 了 瑪莉。
one QUANTIFIER book bei John give TENSE MARKER Mary.
Mary was given a book by John.
- (23) 一 本 書 送 了 瑪莉。
one QUANTIFIER book give TENSE MARKER Mary.
Mary was given a book.

For sentences like (23) in which it is clear that the subject of the sentence cannot be the agent of the event, the omission of '被' do not affect their passive status. As for the sentences like (3) in which the subject of the sentence can be the do-er of the action, the omission of '被' means that these sentences have both passive and active readings, e.g.:

- (24) 雞 吃 了。
chicken eat TENSE MARKER. [7, Page 71,2b']
The chicken ate. / The chicken was eaten.

This property is not shared by the affective '被'-sentences:

- (25) 貓 逃 了。
cat escape TENSE MARKER. [7, Page 71,2d']
The cat escaped.
- (26) 約翰 打破 了 花瓶。
John break TENSE MARKER vase.
John broke the vase.

After removing the '被' and its following NP from (4) and (5), the meaning of these sentences changes. They no longer have the affective reading, but the active reading only. The removal of '被' and its

following NP from affective ‘被’-sentences changes the meaning of these sentences.

The two syntactic behaviours described above are not shared by the passive and the affective ‘被’-sentences. This seems to suggest that the passive ‘被’-sentences and the affective ‘被’-sentences, though they are made up of the same verb ‘被’, have different syntactic behaviours, and they should be treated as different kinds of sentences. While deriving the lexical form (9), Her only considered the syntactic behaviour of ‘被’, and attempted to generalise all the possible syntactic behaviours of different ‘被’-sentences without considering the differences between the lexical semantic implication of this lexical form and the reality. Her’s overly generalised lexical form of ‘被’ therefore results in the mismatch illustrated in Section 4.

5. A NEW REPRESENTATION OF ‘BEI’

Owing to the different syntactic behaviours of passive ‘被’-sentences and affective ‘被’-sentences, it is concluded that these kinds of ‘被’-sentences should be represented differently.

5.1 For Affective ‘bei’-sentences

The lexical form of ‘被’ for affective ‘被’-sentences follows the idea of Her’s lexical form. However, there is no need for the extension “(OBJ PRED) \approx GENERIC” since affective ‘被’-sentences seldom have an object which is not overt. There is no need for the extension “(\uparrow XCOMP OBJ) \approx (\uparrow SUBJ)” also because either there is an overt (XCOMP OBJ) in an affective ‘被’-sentence (e.g. ‘花瓶’ in (5)) or there is none (e.g. in (4)). In either cases, the subject of an affective ‘被’-sentence cannot be assigned to the object in the complement clause of the sentence. Therefore we propose the lexical form for the verb ‘被’ in describing affective voice should be:

$$(27) \quad \boxed{\text{被: } v, \text{ 被} \langle (\text{SUBJ}) (\text{OBJ}) (\text{XCOMP}) \rangle} \\ (\uparrow \text{XCOMP SUBJ}) = (\uparrow \text{OBJ})$$

Note that although the object in (27) is the agent of the event described by the verb in the complement clause (cf. Section 4.1), it is NOT the agent for the affective ‘被’-sentence. The event structure described by an affective ‘被’-sentence describes a complex event which composes of an affective event and the event described by the complement clause. For instance, the sentence (12) “約翰被瑪莉逃走了。” is describing an affective event and an ‘escape’ event. The NP ‘約翰’ indicates the *beneficiary* of the affective event and the NP ‘瑪莉’ indicates the *agent* of the ‘escape’ event. Note that the NP ‘瑪莉’ *only* corresponds to the agent of a part of this complex event, but not the agent of this complex event.

5.2 For Passive ‘bei-sentences’

As illustrated in Section 2, the syntactic properties of passive ‘被’-sentences conformed with the passive transformation presented by Bresnan. The Chinese word ‘被’ in a passive ‘被’-sentence serves two purposes. It acts like:

1. the auxiliary verb ‘be’ in an English passive sentence for indicating passive voice, AND
2. the preposition ‘by’ in an English passive sentence for marking the oblique agent.

The evidence of ‘被’ served as the auxiliary verb ‘be’ is found in the passive ‘被’-sentence (3). As illustrated in Section 4.3, the sentence (24) has both passive and active reading. By introducing the word ‘被’ in (24) to form (3), the active reading of the sentence is eliminated. This proves that ‘被’ does act like the auxiliary verb ‘be’ in modifying the meaning of the sentence. The evidence of ‘被’ serving as the marker for an oblique agent is shown in the difference between sentences (22) and (23). The sentence (23) shows an agent-less version of a passive ‘送’-sentence. This sentence is not ambiguous as it does not have an active reading. The introduction of an agent to this sentence involves the introduction of the word ‘被’ also (cf. (22)). This demonstrates the markedness of the NP indicating the agent of the event (i.e. ‘約翰’ in (22)) and the oblique property of the ‘被’-NP phrase.

With the syntactic behaviours of passive ‘被’-sentences observed above, we therefore conclude that the lexical form for ‘被’ in passive ‘被’-sentences is:

- (28) 被: v, 被 '<(SUBJ) (被OBJ) (XCOMP)>'
 (↑ XCOMP SUBJ) = (↑ 被OBJ)
 (↑ XCOMP OBJ) = (↑ SUBJ)

6. CONCLUSION

In this paper, we demonstrated the problem of applying the lexical mapping theory to the lexical form of '被' suggested by Her. We analysed the cause of this problem in three different areas and it is concluded that the problem was caused by Her's overly generalised lexical form of '被'. We therefore proposed two different lexical forms for describing the two kinds of '被'-sentences.

The two lexical forms of '被' proposed above are much simpler than that suggested by Her and they successfully describe the different syntactic behaviours of the different kinds of '被'-sentences. With these lexical forms, there is no need for the introduction of a generic value for filling the object position. As there are no complicated control relations in the proposed lexical forms, they are easier to be realised in computational terms than the one from Her. Another advantage of the lexical form (28) is that it adequately predicts the transformation undergone during the morpholexical operation 'passive' in a Chinese sentence. This transformation conforms with that presented by Bresnan. While applying the lexical mapping theory onto this lexical form, it works well. The use of a-structure and the lexical mapping theory aids the transfer from English passive sentences to Chinese [10]. A lexical form which reflects the equivalence of Bresnan's universal passive transformation and the Chinese passive transformation facilitates this transfer process.

Although it is uncommon that a verb is assigned two different lexical forms and at the same time it is used as both a verb and an oblique marker, the syntactic behaviours of the Chinese word '被' does support these properties. The lexical forms (27) and (28) offer a much simpler lexical representation for '被' and they successfully predict the different syntactic behaviours of '被'. Therefore, these multiple lexical forms of '被' are better than the one proposed by Her.

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