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LOCATIVE INVERSION: ENGLISH, CHINESE, AND UNIVERSAL GRAMMAR

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ABSTRACT This paper gives a formal account of locative inversion constructions in English and Chinese within a revised Lexical Mapping Theory of Lexical Functional Grammar as a model of Universal Grammar. We propose that the inversion construction be accounted for with a relation-changing morphological operation, rather than with intrinsic role classifications (Lin 1990, Chang 1990) or universal default syntactic specifications (Bresnan and Kanerva 1989, Bresnan 1989). This strategy we employ maintains the maximum universality of the overall lexical mapping framework while accounting for language-specific constructions and alternations.

0. BACKGROUND

Locative inversion verbs, in English and Chinese alike, alternate between an inverted form, as in 1a-b, and an uninverted canonical form, as in 2a-b.

1. a. Tai2-shang zuo4 zhe Zhang1san1.
   stage-top sit ASP Zhangsan
   On the stage was sitting Zhangsan.

   b. Dong4-li tiao4chu1 le yi1 zhi1 lao3hu3.
   cave-inside jump-out ASP a CLS tiger
   Out of the cave jumped a tiger.

2. a. Zhang1san1 zuo4 zai4 tai2-shang.
   Zhangsan sit at stage-top
   Zhangsan is sitting on the stage.

   b. Yi1 zhi1 lao3hu3 tiao4chu1 le dong4-li.
   a CLS tiger jump-out ASP cave-inside
   A tiger jumped out of the cave.

A locative inversion verb thematically requires two roles: theme and locative; furthermore, locative inversion also seems to forbid any other role in the argument structure and thus applies strictly to the thematic structure of <th loc>. *Xie3* 'write', for example, allows no inversion with the a-structure <ag th loc> but when the agent role is unexpressed inversion may obtain. English and Chinese are again alike in this respect, as shown in 3 below.

3.a. Yue1han4 xie3 le yi1 ge zi4 zai4 qiang2-shang.
John write ASP a CLS character at wall-top

a' John wrote a Chinese character on the wall.

b. *Qiang2-shang xie3 le yi1 ge zi4 Yue1han4.

b' *On the wall was written a Chinese character (by) John.

c. Qiang2-shang xie3 le yi1 ge zi4.

c' On the wall was written a Chinese character.

Unlike GB, a movement framework where the alternation between the canonical construction and the derived construction is related by movement(s) in phrase structure terms, Lexical-Functional Grammar (LFG) treats the two surface forms as alternative realizations of surface grammatical relations of the underlying argument structure. This paper explores the mapping from thematic roles to appropriate grammatical functions (GF's) in Mandarin and English locative inversion. The organization is as follows: section 1 gives a brief exposition of the set of mapping principles, known as the Lexical Mapping Theory (LMT), within LFG that constrains the correspondence between argument structure (or a-structure) and functional structure (or f-structure). Section 2 reviews several previous accounts of locative inversion in Mandarin Chinese, English, and other languages, and section 3 contains a revised lexical mapping solution we propose. The implications of our account and the revised LMT are discussed in section 4. Section 5 concludes the paper with a summary.

1. LEXICAL MAPPING THEORY

An essential theoretic assumption of LFG is that a-(rgument) structure, f-(unctional) structure, and c-(onstituent) structure are formally independent of each other, and they are parallel planes of grammatical organization related by local structural correspondences, the same way a melody of a song is related to its words (Bresnan and Kanerva 1989, BK henceforth). The Lexical Mapping Theory (LMT) is the component of LFG that constrains the mapping relations between thematic roles and the corresponding grammatical relations subcategorized for by a predicate. BK first presented the details of LMT; here, however, we adopt an LMT based on the revised model proposed in Her (1997).

4. A Revised Lexical Mapping Theory (Her 1997):

A) the universal thematic hierarchy:
ag > ben > go/exp > inst > pt/th > loc

B) 1. classification of grammatical functions:
SUBJ: [-r -o] OBJ: [-r +o]
OBL_{θ}: [+r -o] OBJ_{θ}: [+r +o]

2. the markedness hierarchy of GF's:

SUBJ	least marked
OBJ/OBL_θ	$\downarrow$
OBJ_θ	most marked

C) the theory of a-structures:

1. intrinsic classifications (IC's):
   primary patient-like role $\rightarrow$ [-r]
   secondary patient-like role $\rightarrow$ [+o]
   (agent-like role $\rightarrow$ [-o])[1]
2. morpholexical/morphosyntactic operations:
   e.g., (English) Passive: $<\theta...> \downarrow \varnothing$
3. default classification (DC): $<\theta_1...\theta_2...>$ with $\theta_2 \downarrow$ [+r]
4. *monotonicity* condition: feature assignment must be feature-preserving.

D) Mapping Principle (MP):

For each role in a-structure that has no higher role available*, map it to the least marked compatible GF available.
(**Availability*: A role or a GF is *available* iff it is not linked to a GF or a role, respectively.)

BK hypothesize a universal hierarchy of thematic roles, which descends from agent, the most active or topical participant in events, as shown in 4A. BK further classify grammatical functions along two binary features: [r] (thematically restricted) and [o] (objective). SUBJ and OBJ are thematically unrestricted as they correspond to a wide range of thematic roles, whereas OBL_θ and OBJ_θ encode restricted thematic roles only. In addition, OBJ and OBJ_θ are objective in that they, unlike SUBJ and OBL_θ, complement transitive predicators. This classification thus yields a set of natural classes of grammatical functions and a markedness hierarchy, as shown in 4B.

Lexical mapping principles relate thematic roles to surface grammatical functions by classifying thematic roles along the same two binary features [r] and [o]. These mapping principles are in turn organized into three sub-components: intrinsic role classifications (IC's), morphological operations, and the default role classification (DC). BK and Bresnan (1989) listed cross-linguistic generalizations of the unmarked grammatical encoding of theme/patient and agent. Her (1997: 138) mentions that the IC for the agent-like role may not be necessary because the MP would default agent, which is the highest role, to SUBJ. However, he kept this IC due to the lack of evidence for the possibility of morpholexical operations linking agent to [+o] GF's. There seems to be some evidence that in a type of agent-patient inversion sentences agent indeed links to the object (as shown in 5a-b below), but no such evidence is found in English. Thus, we are now treating this IC as a parameter in UG, which is set to be off in Chinese and on in English.

5. a. San1 ge ren2 chi1 yi1 bang4 rou4.
   three CLS person eat one pound meat
   Three people eat one pound of meat.

   b. Yi1 bang4 rou4 chi1 san1 ge ren2.
   One pound of meat feeds three people.

Morphological operations, if any, then apply and affect an a-structure by adding, suppressing, or binding thematic roles. An example is the English passive, which suppresses the highest role in an a-structure, as shown in 4C2. The a-structure having been morphologically (re)constructed, the default classification (DC) applies to capture the generalization that the highest role's default function is the subject while lower roles default to non-subject functions. All classifications, however, must preserve syntactic information in that a conflicting value of an existing feature cannot apply. This is known as the monotonicity condition. Given the proper syntactic assignment of thematic roles via IC's and DC, the mapping principle (MP) is stated generally to default every role to the highest, or the least marked, compatible GF that is unique in the lexical form. It also gives the highest role the 'unmarked' linking to the least marked GF, SUBJ, unless otherwise mediated by morpholexical operations, which, because of their feature assignment capacity, may perform function-changing operations. Also note that MP is declarative, not procedural; in other words, MP applies to each role in a-structure randomly, although it in effect applies to roles from the highest to the lowest. We now give a simple demonstration with the English passive verb *broken* and show the mapping between the argument structure and the grammatical function subcategorized for.

6.	broken < ag	th >
IC's:	[-o]	[-r]
Passive (Eng.):	∅	
DC:		
	------------------	------------------
		S/O
MP:		SUBJ

2. PREVIOUS LEXICAL MAPPING ACCOUNTS

In this section, we will review BK's analysis of Chichewa, Bresnan's (1989) similar account of English, and two different applications of lexical mapping on Mandarin locative inversion, Lin (1990) and Chang (1990).

2.1 BK and Bresnan 1989

BK and Bresnan (1989) both propose three cross-linguistic IC's for agent, theme, and locative roles to account for locative inversion in Chichewa and English, with the implication that this account can be universally applicable.

7. Intrinsic role classifications (IC's):
    1) agent encoding: ag → [-o]
    2) theme/patient encoding: th/pt → [-r]
    3) locative encoding: loc → [-o]

Furthermore, they postulate a special DC for locative to be [-r] if the associated theme is focused, or bears the feature [f]. Note this locative default also must precede all other DC's, as shown in 8. They further claim that the distribution of the focus feature is 'a parameter of variation across languages' (Bresnan 1989:299, BK:37) and that for Chichewa and English only a theme or patient as the highest role can bear [f].

8. Default role classifications (DC's):
    1) locative default: <[f] loc>, loc → [-r]
    2) the highest role → [-r]
    3) all other roles → [+r]

Examples in 9a-b demonstrate that this account works for locative inversion in both Chichewa and English.

9.a.

	bewera <	th	loc	> 'come'
IC's:		[-r]	[-o]	
DC's:			[+r]	
		------------	------------	
		O/S	OBL_{loc}	
WF's:[2]		S	OBL_{loc}	

A-lendo-wo a-na-bwer-a ku-mu-dzi.
2-visitor-2 those 2 SB-REC PST-come-IND l7-3-village
Those visitors came to the village.

b.

	bewera <	th	loc	> 'come'
IC's:		[-r]	[-o]	
focus:		[f]		
DC's:			[-r]	
		------------	------------	
		O/S	S	
WF's:		O	S	

Ku-mu-dzi ku-na-bewera a-lendo-wo.
l7-3-village l7SB-REC PST-come-IND 2-visitor-2 those
To the village came these visitors.

Though this account works for Chichewa and English, its first problem is that given the IC [-o] for locative, it fails to account for the Mandarin locative phrase, which not only alternates between an oblique (10a) and subject (10b) function, but may also link to an unmarked object, a [+o] function (10c).

10.a. Hen3duo1 ren1 zhu4 <u>zai4 tai2bei3</u>. (OBL_{loc})
many person live at Taipei
Many people live in Taipei.

b. <u>Tai2bei3</u> zhu4 le hen3duo1 ren1. (SUBJ)
Many people live in Taipei.

c. Hen3duo1 ren1 zhu4 <u>tai2bei3</u>. (OBJ)
Many people live in Taipei.

BK's additional cross-linguistic intrinsic classification, locative encoding: loc $\rightarrow$ [-o], which makes the incorrect prediction that all locatives alternate between subject and oblique only and thus prohibits the mapping of locative to object, is therefore questionable. Furthermore, the postulation of a universal locative default in (8) predicts that all languages allow locative appearing with a focused theme to be mapped to subject. However, we suspect that locative inversion may not exist in non-configurational languages with extensive case markings for grammatical relations, Korean and Japanese, for example. Let's look at a Japanese example.

11.a. Herikoputa ga yama no ue ni orimashita.
helicopter NOM mountain POSS top LOC land
A helicopter landed on top of the mountain.

b. Yama no ue ni herikoputa ga orimashita.
mountain POSS top LOC helicopter NOM land
On top of the mountain landed a helicopter.

c. *Yama no ue ga herikoputa o orimashita.
mountain POSS top NOM helicopter ACC land
On top of the mountain landed a helicopter.

As seen in 11a and 11b, the Japanese locative phrase may exchange positions with the subject and thus the focus presented in 29a-b may indeed be different; however, their grammatical functions must remain the same. BK's locative default overgenerates 29c and should therefore be revised.

Furthermore, as for the focus parameter, which assigns the focus feature [f] to theme, it is entirely unclear to which component of LMT it formally belongs. However, since it applies after IC's and before DC's, one would have to assume that the focus parameter is a morphological operation. This is not entirely satisfactory, however, for morphological operations are restricted to 'add, suppress, or bind roles' in this model (Bresnan 1989:296, BK:26). In section 4, we will propose a revised LMT account that is free from all these difficulties.

2.2 Lin 1990

Lin (l990), doing without the locative default of BK's, proposes two different intrinsic classifications for theme/patient and locative, both disjunctive.

12. Intrinsic role classifications (IC's) (Lin 1990):
    1) agent encoding: ag $\rightarrow$ [-o]
    2) theme/patient encoding: th/pt $\rightarrow$ [-r]/[+o]
    3) locative encoding: loc $\rightarrow$ [+o]/[-r]

13.a. tang3zai4 < th loc > 'lie at'
IC's: [-r] [+o]
DC's: [+r]

O/S OBJ_{loc}
WF's: S OBJ_{loc}
Zhang1san1 tang3zai4 zhuo1zi-shang.
Zhangsan lie at desk-top
Zhangsan lies on the desk. (Lin (35))

b. tang3 < th[f] loc > 'lie'
IC's: [+o] [-r]
DC's: [-r]

OBJ S/O
WF's: OBJ SUBJ
Zhuo1zi-shang tang3 zhe Zhang1san1.
desk-top lie ASP Zhangsan
On the desk laid Zhangsan. (Lin (36))

To have locative inversion entirely determined by intrinsic classifications, this account pays a heavy price by posing ad hoc stipulations on the selection of disjunctive intrinsic classifications for theme and locative. First of all, theme is classified [+o] when it has the feature [f], or focused, (see 13b), and [-r] elsewhere (see 13a). It is further stipulated that locative is intrinsically classified [-r] when the only other role in the a-structure is a focused theme (see 31b); otherwise, locative is classified [+o] (see 13a). This account therefore predicts that cross-linguistically 1) a focused theme, being [+o] intrinsically, never maps to subject, 2) a locative accompanied by a focused theme never maps to oblique, and 3) a locative and a focused theme always appear in a locative inversion construction as subject and object respectively. None of these can be substantiated of course. Earlier Japanese data, 11a-c, contradict prediction 3 that locative inversion is universal; likewise the following Mandarin sentences of 14a-b refute all three predictions.

14.a. Ta1 zai4 qiang2-shang xie3 le yi1 ge zi4.
he at wall-top write ASP a CLS character
He wrote a character on the wall.

b. She2me ren2 zuo4 zai4 tai2-shang?
what person sit at stage-top
Who is sitting on the stage?

As pointed out by Cheng (1983) in a lucid exposition of focus devices in Chinese, predication is an important focus device. Within this view, locative inversion can be seen as employing precisely the discourse strategy of placing the focused element within the predicate. In 14a then, the double-underlined theme may indeed be focused; contrary to prediction 2 above however, the double underlined locative is mapped to an oblique function. Again according to Cheng (1983), another common focus device, besides predication, is the question form. In 14b however, the double-underlined focused theme, contrary to all the predictions above, is still mapped to subject; locative inversion does not obtain!

Locative objects are not dealt with in this account by Lin (1990), though we can reasonably assume that *zhu4* in 10c should have the same lexical mapping as *zhu4zai4* in 15.

15.	zhu4	<	th	loc	>	'live'
IC's:			[-r]	[+o]		
DC's:				[+r]		
			---	---		
			O/S	OBJ_{loc}		
WF's:			S	OBJ_{loc}		

Zhang1san1 zhu4 tai2bei3.
Zhangsan live Taipei
Zhangsan lives in Taipei.

This suggests that *zhu4* and *zhu4zai4* are free variations with identical a-structures and f-structures. The root of this problem is Lin's treatment of *zhu4zai4* as a compound, thus a lexically integrate word. Several tests indicate otherwise. First, unlike a typical verb in Mandarin (16a), it can never take an aspect marker (16b).

16.a. Zhang1san1 dan1xin1 zhe li3si4.
Zhangsan worry ASP Lisi
Zhangsan is worried about Lisi.

b. *Zhang1san1 zhu4zai4 zhe tai2bei3.
Zhangsan live at ASP Taipei
Zhangsan is living in Taipei.

There are also indications that *zhu4* and *zai4* are a verb and a preposition independently. 17a shows that the *zai4* locative phrase can be preposed, while 17b shows that *zai4*, like other prepositions in Mandarin, cannot be stranded.

17.a. Zhang1san1 zai4 tai2bei3 zhu4 zhe.
Zhangsan at Taipei live ASP
Zhangsan is living in Taipei.

b. *Tai2bei3, Zhang1san1 zhu4 zai4.
Taipei Zhangsan live at
*Taipei, Zhangsan is living in.

2.3 Chang 1990

In order to redress BK's failure to account for Mandarin locative objects (see 10c), Chang (1990) also postulates a disjunctive intrinsic classification for the locative role, i.e., loc → [-o]/[+o]; other than this change, her lexical mapping account of Mandarin locative inversion follows that of BK and Bresnan (1989) and thus includes their locative default.

18. Intrinsic role classifications (IC's) (Chang 1990):
1) agent encoding: ag → [-o]
2) theme encoding: th → [-r]
3) dependent roles encoding: loc → [-o]/[+o]

19.a.

	tang3 <	th	loc >	'lie'
IC's:		[-r]	[+o]/[-o]	
DC's:			[+r]	
		O/S	OBL_{loc}/OBJ_{loc}	
WF's:		S	OBL_{loc}/OBJ_{loc}	

Ta1 tang3 (zai4) chuang2-shang.
he lie at bed-top
He lies on the bed. (Chang (81a))

b. tang3 < th[f] loc > 'lie'

IC's:	[-r]	[-o]	
DC's:		[-r]	
	-------------------	-------------------	
	S/O	SUBJ	
WF's:	OBJ	SUBJ	

Chuang2-shang tang3 zhe yi1 ge ren2.
bed-top lie ASP a CLS person
On the bed lies a person. (Chang (81b))

There are several potential problems within this account. First, locative is deterministically classified [-o] when the other expressed role is a focused theme, as seen in 19b, thus achieving locative inversion. Consequently, this account predicts that cross-linguistically a locative accompanied by a focused theme never maps to object. Sentences like 20, which allow a focused theme, double-underlined, and a locative object, underlined, indicate otherwise.

20. Shei2 shui4 di4-shang?
who sleep ground-top
Who sleeps on the floor?

Chang argues that the disjunctive classification of locative ([+o]/[-o]) is well-motivated because locative is a dependent role whose classification is dependent on other expressed roles in the a-structure. The problem is not so much with the notion of dependent roles versus independent roles, but since an intrinsic role classification is universally determined by the inherent nature of the thematic role in question, it obviously weakens the theory of LMT as part of the Universal Grammar (UG) considerably to claim that locative, dependent or not, is intrinsically [-o] or [+o] in Chinese but [-o] in English.

Moreover, this account establishes no criterion to determine when and where locative is to be classified [-o] and when and where [+o]. In 19a for example, while the only other expressed role, theme, which the IC of locative is dependent upon, remains the same, locative nonetheless receives conflicting [-o]/[+o]. This disjunctive classification of locative is of course to achieve the dual realizations of an object and an oblique that Mandarin requires; however, this account is hardly desirable in that it also completely misses the derivational relationship between the two classes of verbs and render them free variations.

3. A REVISED LEXICAL MAPPING ACCOUNT

As demonstrated above, the fundamental problem among these previous analyses of locative inversion that account for language-specific mapping requirements with cross-linguistic generalizations is over-generalization. To account for the lexical mapping of locative role, we will employ the strategy of maximizing the universality of intrinsic and default classifications and keeping language-specific specifications to the morphological sub-component. We maintain BK's IC's for theme/patient and agent in English (21a-b) and only the IC for theme/patient in Chinese (21a); there is no other IC's. Thus, all other thematic roles, including locative, receive no intrinsic values.

21. Intrinsic role classifications:
 a) theme/patient → [-r]
 b) agent → [-o]

With regard to morphological operations, we propose that, following Her (1990, 1997) and Zaenan (1987), among others, other than adding, suppressing, and binding roles, they may also assign syntactic classification values, under the monotonicity condition that such assignment must be feature-preserving. To account for locative inversion in Chinese and English and the related constructions, we postulate three morphological operations: locative inversion (LI), locative transitivization (LT), and locative detransitivization (LD).

22. Morphological Operations:
 1) (English & Chinese) Locative Inversion (LI):

$$\begin{array}{cc} \langle \text{th} & \text{loc}\rangle \\ \downarrow & \downarrow \\ [+\text{o}] & [-\text{r}] \end{array}$$

 2) (Chinese) Locative Transitivization (LT)

$$\begin{array}{cc} \langle \text{th} & \text{loc}\rangle \\ & \downarrow \\ & [+\text{o}] \end{array}$$

 3) (Chinese) Locative Detransitivization (LD):

$$\begin{array}{ccc} \langle \text{ag} & \text{th} & \text{loc}\rangle \\ \downarrow & & \\ \varnothing & & \end{array}$$

We also follow Her (1997) and expand the somewhat ad hoc and controversial (e.g., BK:28) Subject Condition and incorporate it with the Function-Argument Biuniqueness Condition into a much more general and revealing Mapping Principle (repeated as 23 below).

23. Mapping Principle (MP):
 For each role in a-structure that has no higher role available, map it to the least marked compatible GF available.

The MP utilizes the markedness hierarchy of functions (SUBJ > OBJ/OBL$_\theta$ > OBJ$_\theta$). Other than these two extensions, following Her (1997), we also adopt the other lexical mapping components as in BK; however, we do not accept the locative default of BK. 24a-c below demonstrate how our analysis accounts for Mandarin locative inversion.

24.a. tang3 < th loc > 'lie'
IC's: [-r]
DC: [+r]

S/O OBL_{loc}/OBJ_{loc}
MP: SUBJ OBL_{loc}

Ta1 tang3 zai4 chuang2-shang.
he lie at bed-top
He lies on the bed.

b. tang3 < th loc > 'lie'
IC's: [-r]
LT: [+o]
DC: [+r]

S/O OBJ_{loc}
MP: SUBJ OBJ_{loc}

Ta1 tang3 chuang2-shang.
he lie bed-top
He lies on the bed.

c. tang3 < th loc > 'lie'
IC's: [-r]
LI: [+o] [-r]
DC:

OBJ S/O
MP: OBJ SUBJ

Chuang2-shang tang3 zhe yi1 ge ren2.
bed-top lie ASP a CLS person
On the bed lies a person.

This revised LMT account applies to English and Chichewa locative inversion in much the same way, if the same locative inversion morphological operation (LI) (22.1) is also postulated in both languages.

Recall we mentioned earlier that verbs like *xie3* 'write' which allow no inversion with the structure <ag th loc>; locative inversion may obtain, however, only when agent is unexpressed. Similarly, BK and Bresnan (1989) observe that in English and Chichewa locative inversion occurs with passivized transitive verbs. 25 and 26 below are English and Chinese examples. The locative detransitivization operation (LD), followed by locative inversion operation (LI), account for the Chinese data, see 26c below. The English data again can be accounted for similarly, given BK (BK:27) and Bresnan's (1989:297) formulation of English passive operation, which suppressed the highest role; see 25c.

25.a. John wrote a Chinese character on the wall.
b. *On the wall was written a Chinese character (by) John.
c. On the wall was written a Chinese character.

	write <	ag	th	loc	>
IC's:		[-o]	[-r]		
Passive:		∅			
LI:			[+o]	[-r]	
DC:					
	--				
			OBJ	O/S	
MP:			OBJ	SUBJ	

26.a. Yue1han4 xie3 le yi1 ge zi4 zai4 qiang2-shang.
John write ASP a CLS character at wall-top
John wrote a Chinese character on the wall.

b. *Qiang2-shang xie3 le yi1 ge zi4 Yue1han4.
*On the wall was written a Chinese character (by) John.

c. Qiang2-shang xie3 le yi1 ge zi4.
On the wall was written a Chinese character.

	xie3 <	ag	th	loc	>	'write'
IC's:			[-r]			
LD:		∅				
LI:			[+o]	[-r]		
DC:						

			OBJ	O/S		
MP:			OBJ	SUBJ		

4. SOME THEORETICAL IMPLICATIONS

The account we have proposed attains several advantages. First of all, since in the theory intrinsic and default classifications assign values, allowing morphological operations the same capacity does not increase the formal power of the formalism; on the other hand, extending this capacity to morphological rules makes the formalism more expressive and coherent. Similarly, the Mapping Principle replaces the previous function-specific Subject Condition and also the Biuniqueness Condition; furthermore, it fully realizes the consequence of another component of the theory, i.e., the hierarchy of grammatical functions, which is in turn derived from the natural classes of functions. This extension thus also makes the LMT more general and coherent.

The discourse function of locative inversion is accounted for in BK and Bresnan (1989) by assigning the focus feature [f] to the theme role via a morphological operation, while in the accounts of Chang (1990) and Lin (1990) focus is an inherent property of the theme role triggering locative inversion obligatorily. An observant reader probably has noticed that, quite unlike any of the previous accounts, we have left the discourse function of locative inversion totally unaccounted for in our lexical mapping account. Indeed, we have, for we believe that such pragmatic or discoursal features should have no place in the syntax proper, where the lexical mapping theory belongs. Such a mixing of information properly belonging to different autonomous planes in grammar is particularly uncharacteristic of LFG. Our account thus, quite fittingly we believe, allows the (over)generation of locative inversion sentences which may indeed be discoursally inappropriate.

As convincingly established by Birner (1994), the notion of 'presentational focus' argued by BK and Bresnan (1989, 1994) can not account for the full distribution of locative inversion in discourse. Furthermore, Birner's study has made it clear that locative inversion is merely one of the many inversion constructions in English and the information-packaging function, that of presenting more familiar information in discourse before what is less familiar, is common to all inversion constructions. Therefore, it misses this generalization to single out locative inversion and account for its discourse function individually in syntax. In our account, the lexical mapping component merely generates the locative inversion construction and yet leaves the discourse function of the full distribution of inversion to be accounted for in the pragmatic module of the grammar.

In all previous LMT accounts, locative inversion either is implied to be universal or has to be set as a parameter allowing different settings by different languages. The former is simply incorrect, and the latter complicates the universal grammar. By the same token, we refute Huang's (1993) proposed language-specific hierarchy of thematic roles that places goal lower than theme for Chinese. By keeping locative inversion a language-specific morphological operation, which may indeed be shared by many languages, we are able to account for its non-occurrence in other languages, and maintain the universality of all intrinsic and default role classification.

Another advantage of morphological rules is that they capture the derivational relations between different classes of verbs, for example locative inversion verbs and their canonical forms. The canonical form, undergoing no morphological operations, produces an unmarked structure, while locative inversion verbs, mediated by the morphological rule, derives a marked, non-canonical sentence construction. (In a recent study of Mandarin corpus, Chang (1995) has found that the postverbal use of locative phrases is far more frequent than the preverbal use. This finding is consistent with our claim here.) Detransitivized locative inversion verbs like *xie3* 'write' or passivized locative inversion in English is thus even more marked in that two morphological operations must apply to yield its syntactic form. By allowing the language-specific module of morphological operations to interact with the modules of universal principles of intrinsic and default classifications, our account is able to reflect the significant insight by Hsieh (1995) that languages diverge and converge at the same time. While the argument hierarchy is universal, different languages or constructions may manifest varying degrees of transparency in the mapping between thematic roles and surface grammatical functions. The more iconic type displays a more direct correspondence between argument and function and undergoes few morphological operations, while a more abstract type utilizes more morphological schemes. Thus, varying degrees of 'iconic transparency' observed in different languages, e.g., Japanese and English, and different syntactic constructions, e.g., canonical locative construction and detransitivized locative inversion in Chinese, can be viewed as the consequences of different interaction patterns between universal principles, e.g., IC's and DC, and language-specific morphological operations. Such a view lends further support to the Interaction Theory, where the perpetual interaction among various forces in grammar creates the dynamic variation in languages (e.g., Hsieh 1989, 1991, 1992a, 1992b, Her 1991, 1993, 1994, 1997).

5. CONCLUSION

To summarize, we have examined the locative inversion and related constructions in Chinese and reviewed previous accounts of locative inversion within the lexical mapping theory in LFG. We have refuted previous analyses that account for locative inversion by language-specific intrinsic or default classifications and demonstrated that such accounts cannot be validated cross-linguistically. The revised LMT of Her (1997) allows morphological operations to be extended to assign syntactic classification features, and the two previous well-formedness filters, Subject Condition and Function-Argument Biuniqueness Condition, together with the default condition for the highest role, are all generalized in accordance with the markedness hierarchy of functions and incorporated into a unified Mapping Principle. Within this revised and simplified LMT, we are able to account for the relation-changing locative inversion and related constructions in Chinese and English.

More importantly, we have demonstrated that the lexical mapping theory is applicable to typologically different languages such as English, Chichewa, and Mandarin when it is properly constructed, with cross-linguistic intrinsic classifications, a default role classification, a unified mapping principle, and language-specific morphological operations that allow feature-preserving syntactic assignments.

NOTES

1. The parentheses here indicate this IC is parameterized in languages.

2. In BK and all other previous accounts discussed in section 2, instead of the MP Her proposed, two well-formedness conditions, or WF's in short, are posed to filter out ill-formed lexical forms.

27. Well-formedness conditions (WF's):

1. The Subject Condition: every lexical form must have a subject.

2. Function-Argument Biuniqueness: each expressed role must be mapped to a unique function, and conversely.

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