Lexical Mapping in Chinese Inversion Constructions

Panel Discussion: LFG and Chinese

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LEXICAL MAPPING IN CHINESE INVERSION CONSTRUCTIONS

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ABSTRACT This paper accounts for subject-object inversion in Chinese resultative compounds within the lexical mapping theory. The inversion is attributed to the competition for syntactic assignment between the two composing roles in a composite role. This account is extended to the subject-object inversion in verbs of consumption with an agent-domain composite role.

0. INTRODUCTION

The subject and object of resultative compounds (VR) in Chinese exhibit interesting behavior in terms of inversion and causativity. This paper gives an account within LFG's lexical mapping theory (LMT). While causativity is assigned via resultative compounding, it is the competition for syntactic assignment between the two composing roles in a composite role that prescribes causativity and inversion. In section 1, the basic data at issue is introduced. Section 2 then reviews the analysis put forth in Li (1995). An alternative lexical mapping account is proposed in section 3, and section 4 discusses the advantages that this account offers. In section 5, the LMT account is extended to another inversion construction that involves verbs of consumption with an agent-domain composite role. Section 6 concludes the paper.

1. THE BASIC DATA

A resultative compound is formed by two verbs, where the first verb denotes the causing action or event and the second indicates the resulting state or event. I will follow Li (1995) and refer to them as V_{caus} and V_{res} respectively. While V_{caus} may be either transitive, e.g., *zhui* 'chase' and *sha* 'kill', or intransitive, e.g., *pao* 'run' and *ku* 'cry', V_{res} is typically intransitive, e.g., *lei* 'tired', *si* 'dead', and *shi* 'wet'. In order to keep the discussion focused, I will for now use only an example of transitive V_{caus} and expand to other types in 3.3.

1. zhui 'chase <ag pt>'
2. lei 'tired <th>'
3. zhui-lei <ag pt> + <th> → a. <ag pt-th> b. <ag-th pt>

The thematic structure of a resultative compound inherits thematic roles from both of the composing verbs; thus, as shown in 1-3, *zhui-lei* inherits <ag pt> from *zhui*, <th> from *lei* and consequently there may be two possible thematic structures: <ag pt-th> (3a), where the theme role required by *lei* is bound with the patient role of *zhui* and forms a composite role, or <ag-th pt> (3b). And as we can see in sentence 4 below, both thematic structures are valid for *zhui-lei*; however, quite interestingly, there are not only two, but three possible readings from the two thematic structures.[1]

4. Zhangsan zhui-lei-le Lisi.
John chase-tired-asp Lee

a. John chased Lee and Lee got tired.
<ag pt-th> (thematic roles)
S O (syntactic assignment)
John Lee

b. John chased Lee and (John) got tired.
<ag-th pt>
S O
John Lee

c.*Lee chased John and John got tired.
<ag pt-th>
O S
Lee John

d. Lee chased John and (Lee) got tired.
<ag-th pt>
O S
Lee John

As shown in sentence 4's three possible readings, the subject and object positions of resultative compounds may reflect diversified thematic roles, and, as reflected in the reading of 4d, the inversion of subject and object seems to be allowed as well. The question is of course why inversion in 4c is ruled out and yet well-formed in 4d. Another important fact to be noted regarding resultative compounds is that under certain circumstances they assign a causative meaning to the sentence. The extended readings of 4 are listed in 5 below. (Note that [caus] refers to the causer, and [af] to the affectee or cuasee in a causative sentence.)

5. Zhangsan zhui-lei-le Lisi.
a. John chased Lee and made Lee tired.
<ag pt-th>
S[caus] O[af]
John Lee

b. John chased Lee and got tired.
<ag-th pt>
S O
John Lee

c.*Lee chased John and John got tired.
<ag pt-th>
O S
Lee John

d. Lee chased John and John made him tired.
<ag-th pt>
O[af] S[caus]
Lee John

In both 5a and 5d, Zhangsan, the subject, is the one that is responsible in causing Lisi, the affectee in object position, to be tired. However, note also that such causer-affectee meaning is not immediately available in 5b between Zhangsan and Lisi. Stated simply, the purpose of our discussion here is to answer two questions: 1) why is the inversion in 5d possible while in 5c it is not? 2) Why is the causative meaning present in 5a and 5d, but not in 5b? In the next section I will review the account provided in Li' (1995) and my own analysis within LFG will be given and defended in section 3 and 4.

2. THE CAUSATIVE HIERARCHY ACCOUNT

Li (1995) provides an account within the government and binding (GB) framework. The linking between theta roles of a predicate and syntactic argument positions is constrained by the thematic hierarchy, where the prominence of theta roles, e.g., agent over theme, corresponds to the structural prominence of the syntactic argument positions, e.g., subject over object (e.g., Li 1995). The reading of 4c is thus ruled out because the more prominent agent role is assigned to the less prominent object while the less prominent patient is linked to the most prominent subject position. In 4d, however, Li sees a comparable violation of the thematic hierarchy and sets out to find an explanation for its well-formedness.

Having ruled out movement as the possible account, Li finds it necessary to employ additional theoretical constructs: two causative roles (or c-roles in short), Cause and Affectee, in a 'causative hierarchy', where Cause is more prominent than Affectee. Note that the causative roles and the causative hierarchy are distinct from the thematic roles and the thematic hierarchy. While it is not clear whether c-roles are in general lexically assigned to syntactic positions, resultative compound verbs assign c-roles directly to an argument in a syntactic position according to the causative hierarchy, i.e., Cause to subject, Affectee to object. However, the c-role assignment scheme needs to be further constrained in relation to resultative compounds.

6. C-role assignment conditions (Li 1995: 267-268 (24)):
   a. The argument in the subject position receives the c-role Cause from a resultative compound only if it does not receive a theta role from V_{res}.
   b. The argument in the object position receives the c-role Affectee from a resultative compound if it receives a theta role at least from V_{res}.

Another stipulation crucial to his analysis is that the causative hierarchy may override the thematic hierarchy, as stated in 7 below (Li 1995: 269 (27)):

7. Theta roles can be assigned contrary to the thematic hierarchy if the arguments receiving them are assigned c-roles in ways compatible with the causative hierarchy.

A violation of the thematic hierarchy thus does not cause ungrammaticality if sanctioned by the causative hierarchy. In 5c, the subject receives a theta role from V_{res}, and thus, according to 6a, does not receive c-role Cause; also, its object does not receive a theta role from V_{res} and thus, according to 6b, receives no c-role Affectee. The reading of 5c is therefore ruled out because the syntactic assignment of its theta roles violates the thematic hierarchy and the syntactic arguments assigned the theta roles receive no c-roles to override this violation.

In 5d, on the other hand, though the syntactic assignment of theta roles violates the thematic hierarchy, it is sanction by the overriding causative hierarchy. More specifically, subject Zhangsan does not receive a theta role from V_{res} and is thus assigned c-role Cause, as prescribed in 6a; object Lisi, on the contrary, does receive a theta role from V_{res} and is therefore assigned Affectee, according to 6b. Since the causative hierarchy is observed in the syntactic assignment of c-roles, the reading of 5d is well-formed in spite of its apparent violation of the thematic hierarchy.

Accordingly, 5a and 5b are also accounted for. In 5a, subject receives an agent role only from V_{caus}, not V_{res}, and thus also the c-role Cause, while object receives a theta role from both of the two composing verbs and thus also the c-role Affectee. The reading of 5a is therefore well-formed with the causative meaning. In 5b, however, the subject and object, though receiving theta roles consistent with the thematic hierarchy, do not qualify the conditions in 6a-b and thus receive no c-roles. Therefore, 5b is wellformed, but with no causative meaning.

Li's analysis, though descriptively adequate, is unrevealing. First of all, this account complicates the grammar by employing additional theoretical constructs, i.e., the two c-roles and the causative hierarchy. Furthermore, there is no independent motivation for the direct assignment of c-roles to syntactic positions. Equally ad hoc is the stipulation for the causative hierarchy to override the thematic hierarchy. The c-role assignment conditions and the causative hierarchy simply do not reflect any of the independently-motivated principles in the theory.

3. A LEXICAL MAPPING ACCOUNT

I will now attempt an alternative analysis within the lexical mapping theory (LMT). In 3.1, I will present the version of LMT adopted here. In 3.2, the issue of grammaticality within the basic data will be dealt with and a proper analysis given, while the issue of causativity will be accounted for in 3.3. Some relevant data beyond the basic data is given in 3.4 and accounted for within the same analysis.

3.1 Lexical mapping theory

The LMT adopted here is based on Bresnan and Kanerva (1989), Bresnan and Zeanen (1990), and Her (1997), with some modifications. Briefly, LMT in general assumes a universal thematic hierarchy and markedness hierarchy of grammatical functions (GF's).

8. Thematic Hierarchy:
   ag > ben > go/exp > inst > pt/th > loc

9. Markedness Hierarchy of GF's:

SUBJ	least marked
OBJ/OBL$_\theta$	
OBJ$_\theta$	most marked

The thematic hierarchy assumes an order of prominence among semantic arguments in language, descending from agent. Among GF's, SUBJ is ranked the highest, i.e., the least marked, and OBJ$_\theta$ the lowest or the most marked. This markedness hierarchy is based on a further classification of GF's in terms of two features: r (thematically restricted) and o (objective), as in 10, where SUBJ has the minus values and OBJ$_\theta$ has the plus values.

10. Classification of GF's:

SUBJ [-r -o]	OBL$_\theta$ [+r -o]
OBJ [-r +o]	OBJ$_\theta$ [+r +o]

The lexical mapping theory adopted here consists of two components: the theory of a-structure and a single mapping principle.

11. The theory of a-structure:
   a. intrinsic classifications (IC's):
      primary pt $\rightarrow$ [-r]; secondary pt $\rightarrow$ [+o]
   b. morpholexical and morphosynactic operations
   c. default classifications (DC's):
      all roles except the highest $\rightarrow$ [+r]

12. mapping principle (MP):
   For each expressed role in a-structure that has no higher role available*, map it to the highest compatible GF available.
   (*A role is *available* iff it is not linked to a GF, and conversely.)

It should be noted that the assumptions behind the term 'thematic hierarchy' in GB and LFG are somewhat different. In LFG, the assumption is simply that there is a universal order of prominence among semantic arguments; it does not assume, however, that the thematic hierarchy aligns with the order of prominence among grammatical functions. Such alignment between the thematic hierarchy and the hierarchy of GF's is the default case nonetheless, which is implicit in the mapping principle. Thus, inversions or other syntactic assignments that seemingly violate the thematic hierarchy in GB terms may be allowed in LFG as long as such an assignment is sanctioned by the lexical mapping theory.

3.2 The Issue of Grammaticality within the Basic Data

Recall that, as exemplified in 3 (repeated as 13 below), the resultative compound receives thematic roles from both of the composing verbs. The verb *zhui-lei* thus inherits <ag pt> from *zhui*, <th> from *lei*. Either of *zhui*'s two roles may be bound with the theme role of V_{res}, resulting in two possible thematic structures: <ag pt-th> (13a) and <ag-th pt> (13b). Thus, similar to Li (1995), I assume a grammatical function may be linked to a composite role formed by two roles, one from each of the two participating events (also cf., Huang 1992). As the possible readings of 4 (repeated as 14) indicate, both of the two thematic structures are valid for *zhui-lei*.

13. zhui-lei 'chase-tired'
   a. <ag pt-th>
   b. <ag-th pt>

14. Zhangsan zhui-lei-le Lisi.
   John chase-tired-asp Lee

   a. John chased Lee and Lee got tired.
      <ag pt-th>
      S O
      John Lee

   b. John chased Lee and (John) got tired.
      <ag-th pt>
      S O
      John Lee

   c.*Lee chased John and John got tired.
      <ag pt-th>
      O S
      Lee John

   d. Lee chased John and (Lee) got tired.
      <ag-th pt>
      O S
      Lee John

Within the thematic structure of <ag pt-th> only one reading (14a) is allowed; in other words, syntactic assignment of thematic roles produces only one syntactic structure: agent to SUBJ and pt-th to OBJ. The other thematic structure, <ag-th pt>, interestingly, allows two argument-function linking patterns: 14b, where ag-th maps to SUBJ and patient maps to OBJ, as well as 14d, where subject and object are inverted, with ag-th mapping to OBJ and patient to OBJ. The syntactic assignment in 14b and 14d is quite the opposite. Let's take a closer look at how LMT predicts what each thematic structure's syntactic assignment will be. I will repeat 14a and 14c as 15a and 15c below with lexical mapping details.

15a. John chased Lee and Lee got tired.

	<ag	**pt-th>**
IC		-r

	S/O/...	S/O
MP	S	O
	John	Lee

15c.*Lee chased John and John got tired.

	<ag	pt-th>
	O	S
	Lee	John

Note that within the composite role pt-th, the two composing roles share exactly the same syntactic classification, and therefore there is no competition and both figure equally (indicated by bold characters in 15) in the syntactic assignment of the entire composite role. Given <ag pt-th> then, LMT predicts correctly that 14a is well-formed, where agent maps to subject, pt-th to object. Furthermore, LMT predicts that the 15a has the only possible syntactic assignment for <ag pt-th> and thus rules out 15c. The other thematic structure <ag-th pt>, on the other hand, has two possible readings, 14b and 14d, repeated below as 15b and 15d, again with lexical mapping details.

15b. John chased Lee and (John) got tired.

	<ag-th	**pt>**
IC		-r

	S/O/...	S/O
MP	S	O
	John	Lee

15d. Lee chased John and (Lee) got tired.

	<ag-**th**	**pt>**
IC	+o	-r

	O/OBJ_{θ}	S/O
MP	O	S
	Lee	John

Note that here the two composing roles, agent and theme, within the composite role ag-th have different syntactic classifications, according to the theory of a-structure in 11. Thus, the two cannot figure equally in the syntactic assignment of the composite role--one has to be suppressed[2]. In 15b then, agent figures prominently, suppressing theme, in the linking of the entire composite role ag-th to subject. In 15d, however, the opposite takes place--theme figures prominently, suppressing agent, and links the composite role ag-th to object, while the primary patient maps to subject, creating an inversion of grammatical functions in comparison with 15b. Note that here between patient and theme the latter is the secondary patient by virtue of its being bound of the agent role in a composite role ag-th. Both 15b and 15d are thus well-formed, as predicted by LMT.

3.2 The Issue of Causativity

Within the three possible readings in 15, the fact remains that the causative meaning exists in 15a and 15d but not 15b. The extended readings are repeated below.

15. Zhangsan zhui-lei-le Lisi.
a. John chased Lee and made Lee tired. (Causative)
b. John chased Lee and got tired. (non-Causative)
d. Lee chased John and John made him tired. (Causative)

Since all these readings share an identical constituent structure, or c-structure, the causative reading certainly cannot be assigned by any structural configuration. Although in 15a and 15d the cause is always the subject, the affectee always the object, the subject and object in 15b do not carry such meaning.[3] This indicates that the causative meaning is not consistently identified with any grammatical function either. Likewise, it is not always associated with any particular thematic role either. In 15a, agent John is the cause, patient Lee the affectee; yet in 15d, John, now the patient, is the cause, Lee, the chaser, is the affectee, not to mention the fact that thematic roles in 15b carry no such meaning. Moreover, the causative meaning is not a semantic property of either of the two composing verbs, V_{caus} or V_{res}. It is therefore reasonable to conclude that the causative meaning comes from the resultative compound as a whole. I also agree with Li's (1995: 266-267) hypothesis that such causative meaning is assigned by a predicate only if the internal structure of a causal event is overtly represented by this predicate, because monomorphemic verbs do not overtly represent the internal structure of a causal event. However, I do not consider it necessary to stipulate an independent plane of representation consisting of causative roles. The causative meaning can simply be a property within the general domain of semantics.

A closer look at the thematic structures and syntactic assignments of 15a and 15d, where the causative meaning is present, would reveal that the affectee is always the theme role of V_{res}. But note that the same theme role in 15b carries no such affectee meaning. The key to this lies in the one property shared by the theme role of V_{res} in 15a and 15d: that is, this theme role, bound with patient of V_{caus} in the composite role pt-th in 15a and bound with agent of V_{caus} in the composite role ag-th, figures prominently in the syntactic assignment of the composite role in both 15a and 15d. In 15b, however, it does not figure prominently in the syntactic assignment of the composite role ag-th. Thus, it is quite reasonable to assume that resultative compounding assigns the thematic role from V_{res} the additional meaning of being the affectee, which however is not available for semantic interpretation if this role does not figure prominently in syntactic assignment. Cause, of course, should not be indentified within the same role as Affectee and is naturally assigned to a role of the causing event. A formalized formulation is given in 16.

16. Causative Assignment in Resultative Compounding:
Assign Cause ([caus]) to θ_a and Affectee ([af]) to θ_b iff
a. θ_a is of V_{caus}, θ_b of V_{res},
b. θ_a-θ_b is not a composite role, and
c. θ_a and θ_b both figure prominently in syntactic assignment.

In 17 below I will illustrate the syntactic assignment of thematic roles in the basic data, with details of causative assignment. Again, note that a thematic role that figures prominently in syntactic assignment is highlighted with bold print.

17. Zhangsan zhui-lei-le Lisi.
John chase-tired-asp Lee

a. John chased Lee and made Lee tired. (Causative)
<ag **pt-th>**
S[caus] O[af]
John Lee

b. John chased Lee and got tired. (non-Causative)
<ag-th **pt>**
S O
John Lee

d. Lee chased John and John made him tired. (Causative)
<ag-**th** **pt>**
O[af] S[caus]
Lee John

In short, in 17a and 17d alike, theme from V_{res} is assigned Affectee, while in 17a Cause is assigned to agent of V_{caus} and in 17d it is patient from V_{caus} that meets the conditions for Cause. In 17b, however, since theme from V_{res} does not figure prominently in syntactic assignment, no causative reading is available.

3.3 Further Data

The basic data consists of the most common type of resultative compounds, where V_{caus} is transitive. I will now extend this LMT analysis to resultative compounds where V_{caus} is intransitive. The single thematic role of V_{res} may or may not be bound with the single role of V_{caus}. In 18 and 19 an example is found where the two roles are not bound in a composite role.

18. a. ku 'cry': V, <ag>
b. hong 'red': V, <th>
c. ku-hong 'cry-red': V, <ag th>

19. Lisi ku-hong-le yanjing.
Lee cried his eyes red.

<ag **th>**
IC -r

S/O/... S/O
MP S[caus] O[af]
Lee eyes

The LMT account predicts, correctly, that 19 has only one well-formed reading, which carries the causative meaning. Furthermore, this LMT account applies to resultative compounds in the *ba*-construction. As noted in Li (1995:271), although the sentence in the basic data has three possible readings, its *ba* counterpart interestingly allows only the two causative readings.

20. Zhangsan ba Lisi zhui-lei-le.
John BA Lee chase-tired-asp

a. John chased Lee and made Lee tired. (Causative)
<ag **pt-th>**
S[caus] O[af]
John Lee

b.*John chased Lee and got tired.
<ag-th **pt>**
S O
John Lee

c.*Lee chased John and John got tired.
<ag **pt-th>**
O S
Lee John

d. Lee chased John and John made him tired. (Causative)
<ag-**th** **pt>**
O[af] S[caus]
Lee John

It is well-known that *ba* introduces an affected object; thus, the LMT account I proposed would predict that, when used with a resultative compound, *ba* can only introduce the argument that receives the feature [af] and maps to object. And indeed it does. In both 20a and 20d, the *ba*-marked NP, i.e., Lee, is associated with object and in turn the affected theme. In 20b, however, the only possible syntactic assignment for the affected theme is to the subject position, which makes it impossible for the object to receive the affected meaning; 20b is thus not a possible reading. Recall that 20c is ill-formed because of its untenable mapping relations.

The *bei* construction is even more restrictive--only one of the three possible readings is permissible with the resultative compound. The morpholexical rule responsible for passive operations, stated in 21 below, suppresses the highest role, which may be bound with an adjunctive function marked by *bei*.

21. Passive: $< \theta .. >$
$\downarrow$
ϕ

22. Lisi bei (Zhangsan) zhui-lei-le.
Lee BEI (John) chase-tired-asp

a. John chased Lee and made Lee tired.
Lee was chased and made tired (by John).
<ag **pt-th>**
IC [caus] -r[af]
PASS. ϕ

S/O
MP S[af]
(John) Lee

b.*John chased Lee and got tired.
*Lee was chased by John and John got tired.
<ag-th **pt>**
ϕ S
(John) Lee

c.*Lee chased John and made John tired.
*John was chased and made tired by Lee.
<ag **pt-th>**
[caus] S[af]
(John) Lee

d.*Lee chased John and John made him tired.
*John was chased by Lee and Lee was made tired by John.
<ag-**th** **pt>**
[af] S[caus]
(John) Lee

As noted by Li (1995:277) and others, *bei* requires a verb with an affected internal argument, which is linked with the passivized subject. In the four logically possible readings in 22 above, only in 22a the affected argument, th[af], is linked to the subject and still retains its theme reading. The LMT account thus predicts correctly only 22a is well-formed. The sentence is also causative, with Lee, the subject, as the affected and John, in the *bei* adjunct phrase indirectly expressing the suppressed agent, as the cause.

4. DISCUSSION

In the LMT account no additional theoretical constructs such as the causative hierarchy is needed. Moreover, the universal thematic hierarchy is maintained, whereas a violation arises in Li's analysis. The former is thus simpler and more straightforward. Also, as mentioned earlier, there is no logical reason why the c-role conditions should override the thematic hierarchy, why Cause should be assigned to subject only, and why object only may receive Affectee. In short, these conditions do not seem to reflect any significance or logical consequence of other components within the theory of GB.

Within the LMT account, the grammaticality of the four logically possible readings of *zhui-lei* is fully predicted by the theory. The assignment of causativity is also consistent with the event structure of the resultative compound, in which V_{caus} and V_{res} overtly represent the activity and the resulting state respectively (e.g., Li 1995:279).

23. event

activity state

Within this event structure, Affectee is naturally the role that undergoes the resulting state of V_{res}. Since Affectee and Cause cannot be identified within the same role, Cause can only be the role of V_{caus} that does not form a composite role. Thus, causative roles are assigned to thematic roles, not to grammatical functions or syntactic positions. The condition that a role must figure prominently in syntactic assignment for its causativity meaning to be available is also reasonable because wherever the Affectee role does not figure prominently in syntactic assignment it is being suppressed by the competing role that it is bound to in a composite role.

Li's account, in contrast, assigns the causative roles directly to syntactic positions, I will demonstrate that his account makes incorrect predictions. Consider a passive sentence with or without an overt agent.

24. Lisi bei (Zhangsan) zhui-lei-le.
Lee BEI (John) chase-tired-asp
Lee was chased and made tired (by John).

Clearly, Lee, Affectee, is not in the surface object position and John, Cause, is not the surface subject. Li thus claims that c-role assignment happens at D-structure and 24 is merely an apparent counter-example (1995:277). Nonetheless, in a standard movement account of passive (e.g., Tsao 1996:163-167), Zhangsan, the external argument, is absorbed and the subject position at D-structure, in fact, is left empty, while Lisi, the internal argument, occupying the object position, moves to the subject position to receive case. Therefore, Lisi at S-structure should have both c-roles, Affectee and Cause. Clearly then, it is problematic to assign Cause and Affectee to syntactic positions or grammatical functions. In the LMT account, Zhangsan, the external argument of V_{caus}, though suppressed by passive, may indeed receive Cause and be 'indirectly expressed as an optional, thematically bound adjunct' (Bresnan 1989:297). Therefore, in 24, the Cause role may be either implicit or bound with the *bei* adjunct phrase.

Finally, I will make the observation that lexical mapping between thematic structure and syntactic structure may reflect certain psycholinguistic reality in sentence processing. Consider again the three possible readings in 25.

25. Zhangsan zhui-lei-le Lisi.
John chase-tired-asp Lee

a. John chased Lee and made Lee tired. (Causative)
<ag **pt-th>**
S O
John Lee

b. John chased Lee and got tired. (non-Causative)
<ag-th **pt>**
S O
John Lee

d. Lee chased John and John made him tired. (Causative)
<ag-**th** **pt>**
O S
Lee John

In isolation, 25 has the 'basic' meaning of 25a (cf., Li 1995:256fn), while 25d is no doubt the most difficult to obtain, and it in fact in Li’s continuous research on resultative compounds came much later as a surprise when made aware of its possibility (Li 1995:257). I would argue that this order of saliency among the readings reflects their the degree of transparency in the mapping between the thematic structure and the syntactic structure. In 25a, the composite role is formed by patient and theme, two roles that share identical syntactic classifications. Agent defaults to subject, pt-th defaults to object, both are straightforward. Lexical mapping of 25a is thus the most transparent. In 25b the complication is that in the composite role a role is suppressed in syntactic assignment. In 25d, however, agent is suppressed by a lower theme in linking the composite role to object, thus creating an inversion with patient mapping to subject; the syntactic assignment of thematic roles is therefore more opaque compared with the other two readings.

5. ANOTHER INVERSION CONSTRUCTION

Another well-known, and yet much less studied, subject-object inversion construction in Chinese involves verbs of consumption, e.g., *chi* ‘eat’, *he* ‘drink’, and *chou* ‘smoke’, and verbs of accommodation, e.g., *zhu* ‘live’, *zuo* ‘sit’, and *shui* ‘sleep’. In this paper I will discuss only verbs of consumption.

26. Henduo ren chi rou.
Many person eat meat
Many people eat meat.

27. Yi bang rou chi liang ge ren.
one pound meat eat two CL person
One pound of meat feeds two people.

28. Yi zhi ji chi liang ge ren.
one CL chicken eat two CL person
a. One chicken eats two people.
b. One chicken feeds two people.

In 26 *chi* 'eat' is a transitive verb of thematic structure <ag th>, with the straightforward mapping of agent to subject and theme to object. However, in 27, subject and object are inverted, even though the agent and theme reading still obtains. Therefore, given an appropriate context a sentence with *chi* can be ambiguous, like 28. What is different in 27 and 28b is that the object *liang ge ren*, besides being the agent of *chi*, also specifies the extent of the action. In other words, it also has the role of domain (cf., Teng 1975:95, Huang 1993:372-4). An argument must be unique in a thematic structure. In 29, *yi tian* is the domain without the agent reading, while *shi ge ren* in 30 is a agent-domain composite role. As indicated by 31, *chou* 'smoke' does not allow two domain roles.

29. Yi bao yan chou yi tian.
one pack cigarette smoke one day
One pack of cigarette is enough to smoke for one day.

30. Yi bao yan chou liang ge ren.
one pack cigarette smoke two CL person
One pack of cigarette is enough for two people to smoke.

31.*Yi bao yan chou liang ge ren yi tian.
One pack of cigarette is enough for two people to smoke for one day.

Therefore, I assume that in Chinese there is a lexical option for these verbs to add a domain role and bind it with the highest role (cf., Huang 1993:372), as shown in 32. Following Huang (1993), domain has IC [+o] in Chinese and is listed on a par with loc in the thematic hierarchy, as in 33[4].

32. Domain-addition morpholexical operation[5]:

$$\begin{array}{ll} <\theta & \theta> \\ \downarrow & \downarrow \\ \theta\text{-dom} & \theta \end{array}$$

33. Thematic Hierarchy:
ag > ben > go/exp > inst > pt/th > dom/loc

Thus, in 27 and 28b, verb *chi* 'eat' has thematic structure <ag-dom th>. Similar to the composite roles in resultative compounds then, within the composite role ag-dom, the two composing roles, due to their distinct IC's, competes for syntactic assignment and thus create inversion.

34. Henduo ren chi rou.
Many people eat meat.

	<ag	th>
IC		-r
	S/O…	S/O
MP	S	O
	people	meat

35. Yi bang rou chi liang ge ren.
One pound of meat feeds two people.

	<ag-**dom**	th>
IC	+o	-r
DC	+r	
	OBJ_θ	S/O
MP	OBJ_θ	S
	people	meat

36. Liang ge ren chi yi bang rou.
One pound of meat feeds two people.

	<**ag-**dom	th>
IC		-r
	S/O…	S/O
MP	S	O
	people	meat

6. CONCLUSION

In this paper I have demonstrated that the resultative inversion and causativity can be adequately accounted for within the lexical mapping theory without additional theoretical devices, unlike Li's (1995) GB analysis that relies on an additional causative hierachy. The account I proposed rests crucially upon the concept of 'composite roles', where two roles are bound as one. A composite role may link to two distinct grammatical functions if the two composing roles are classified for distinct IC's and therefore compete for syntactic assignment. Otherwise, the composite role links to a unique function. I further extended this account to another inversion construction in Chinese that involves verbs of consumption with an agent-domain composite role.

NOTES

1. The readings in 4b and 4d may be somewhat difficult to obtain for some native speakers. The following corresponding examples however should make the task

much easier. The semantic and syntactic structure of 37 is identical with that of 4b, and 38 is similar to 4d.

37. Zhangsan chi-bao-le fan.
John eat-full-asp rice
John ate rice and got full.
<ag-th pt>
S O
John rice

38. Zhe zhong dongxi hui chi-si ni.
this kind stuff will eat-die you
Eating this kind of stuff will kill you.
<ag-th pt>
O S
you medicine

2. This is very close in spirit to Huang's (1992) argument selection principle for composite predicates like resultative compounds in that only one composing role in a composite role figures prominently in syntactic assignment, unless, of course, the two compoing roles share the same syntactic assignment.

3. I will largely follow Li's (1995) use of the terms 'Cause' and 'Affectee', rather than Huang's (1988) 'Causer' and 'Causee'. As Li has noted (1995: 266), the term 'Causer' is often associated with agentivity or volition, which is not always true for the cause in a causative sentence. Note however, I use them as general terms, not as the so-called c-roles proposed by Li.

4. However, partially for sentences like the following, I will claim that between these two roles loc is higher than dom and that loc is unspecified for IC in Chinese.

40. Yi ba yizi zuo liang ge ren
one CL chair sit two CL person
One chair seats two people.

	<loc	th-**dom**>
IC		+o
DC		+r

	S/O/…	OBJ_θ
MP	S	OBJ_θ

5. The whole picture of domain's behavior in Chinese is certainly much more complex than this and a more comprehensive formulation is beyond the scope of the paper.

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