Interaction of Thematic Structure and Syntactic Structures: On Mandarin Dative Alternations

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This paper gives an account of Chinese dative alternations: (a) [V NP_1 *gei* NP_2] and (b) [V*(gei)* NP_2 NP_1] and compares them with their English counterparts. I establish the compound status of V*gei* in (b), identify in V*gei* compounding a subclass of V with clearly definable lexical semantics, and demonstrate that post-object *gei* in (a) can be either a goal-marking preposition or a verb heading a VP adjunct. I then render a formalized account within the simplified lexical mapping theory given in Her (1997ms). The dative operation assigns [+o] to goal in Chinese and English alike, while the difference with passivized goal in the two languages is accounted for with an optionality parameter of the syntactic assignment of [+r] to goal in passive operations.

1. BACKGROUND

The dative alternations in Chinese and English seem to parallel, as in 1-2, where Mandarin post-object *gei3* looks suspiciously similar to the English goal-marking preposition *to*. This indeed is the most widely accepted view among Chinese grammarians and most accounts (e.g., Teng 1975, Tang 1979, Li and Thompson 1981, Her 1990, Huang 1995, Her and Huang 1995b) also extend the prepositional status to *gei3* immediately following the verb, as shown in 3.

1.a. Li3si4 song4 le ta1 yi1 duo3 hua1.
Lee give ASP she one CLS flower
b. Lee gave her a flower.

2.a. Li3si4 song4 le yi1 duo3 hua1 gei3 ta1.
Lee give ASP one CLS flower to she
b. Lee gave a flower to her.

3.a. Li3si4 song4 gei3 le ta1 yi1 duo3 hua1.
Lee give to ASP she one CLS flower
b.?Lee gave to her a flower.

Against this conventional view and in support of Chao (1968), Huang and Mo (1992) argue instead that 2a involves a serial verb construction, where post-object *gei3* is a verb, and in 3a *gei3* is a verbal suffix in the V*gei3* sequence (Huang 1990, 1993). Thus, in their view, no parallel is justified between English dative *to* and Mandarin *gei3*.

This paper will argue that *gei3* is not a suffix in the V*gei3* sequence; rather it is the verb head in V*gei3* compounds. I further argue that *gei3* as the second verb in a serial verb construction does not rule out the grammaticality of preposition *gei3* in constructions like 2a. Thus, 1a and 3a are identical in syntactic structures, while 1a and 2a are two distinct surface structures related to each other by the same thematic structure, parallel to their English counterparts, 1b and 2b. Section 2 also demonstrates that the prepositional analysis of post-object *gei3* is indispensable in identifying a natural class of verbs that form V*gei3* compounds.

Section 3 then incorporates this analysis of Mandarin dative shift within a revised lexical mapping theory (LMT) of Lexical-Functional Grammar (LFG). I will first introduce the various components of the theory before presenting a formalized account of dative and passive in Chinese and English. Section 4 discusses the implications of this LMT implementation and concludes the paper.

2. STATUS OF *GEI3* AND DATIVE SHIFT

Like other Chinese prepositions, e.g., *gen1* and *zai4*, *gei3* has rather diverse functions. It functions as a verb meaning 'to give', and it is also a preposition. In this paper, however, I will not discuss its preverbal functions as a preposition, such as an agent marker, patient marker (e.g., Paul 1988, Dan 1994), and beneficiary marker (e.g., Li and Thompson 1981, Paul 1988). The focus here is on *gei3* the ditransitive verb, as in 4 below, and its somewhat controversial status in postverbal positions, as in constructions 5 and 6.

4. *gei3* NP_2 NP_1
5. V *gei3* NP_2 NP_1
6. V NP_1 *gei3* NP_2

It is certainly without question that *gei3* is a full-fledged ditransitive verb in construction 4, much like Mandarin *song4* (1a) and English *give* (1b); however, its status in 5 and 6 is less clear. In 2.1 I present several pieces of evidence for V*gei3* in construction 5 as a ditransitive compound verb. In 2.2 I argue that *gei3* in 6 may be either a verb or a preposition, depending on the argument structure of the matrix V. I then bring the analyses in 2.1 and 2.2 together, in 2.3, by identifying a semantically coherent class of verbs that constitute the first member in a V*gei3* ditransitive compound verb. In 2.4 and 2.5, I demonstrate that although Chinese and English share the same dative shift constructions, the interaction between dative shift and passive is different in the two languages.

2.1 V*gei3* compounds

The attachment of aspect markers is the most commonly employed test for the verb status of a Mandarin word. It is often misused, however, to test the lack of verbhood as well. While verbs typically allow aspect attachment, some, e.g., pivot verbs such as *shi3* 'cause', *ling4* 'make', *bi1* 'force', and *rang4* 'allow' and modal verbs such as *ying1gai1* 'should', *neng2* 'can', and *bi1xu1* 'must', do not (e.g., Her 1990). On the other hand, only verbs, not prepositions or anything else, allow aspect markers (e.g., Chao 1968, Her 1990, McCawley 1992). The crucial point is thus that aspect attachment is a sufficient condition of verbhood in Mandarin, but not a necessary one. Indeed no other test is more reliable for the positive identification of Mandarin verbhood (e.g., McCawley 1992: 227).

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7.a. Li3si4 diu1 le  yi1 duo3 hua1   gei3 ta1.
     Lee    toss ASP one CLS  flower to   she
     Lee tossed a flower to her.

  b. Li3si4 diu1gei3 le  ta1 yi1 duo3 hua1.
     Lee    toss     ASP she one CLS  flower
     Lee tossed her a flower.

  c.*Li3si4 diu1 le  gei3 ta1 yi1 duo3 hua1.
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Lee toss ASP to she one CLS flower

8.a. Li3si4 mai3 le yi1 duo3 hua1 gei3 ta1.
Lee buy ASP one CLS flower to she
Lee bought a flower for her.

b. Li3si4 mai3gei3 le ta1 yi1 duo3 hua1.
Lee buy ASP she one CLS flower
Lee bought her a flower.

c.*Li3si4 mai3 le gei3 ta1 yi1 duo3 hua1.
Lee buy ASP to she one CLS flower

Sentences 7a and 8a thus show that *diu1* 'toss' and *mai3* 'buy' are verbs. Likewise, *le* attachment in 7b and 8b positively identifies *diu1gei3* and *mai3gei3* as verbs, while the ungrammaticality of 7c and 8c also indicates that V*gei3* sequences are lexical units, whose lexical integrity must be maintained (cf., Huang 1984). Huang (1990) and Huang and Mo (1992) are therefore entirely correct in this respect and should be applauded for supporting this position of Chao's (1968), which indeed had been long overlooked. The remaining issue is, however, whether *gei3* is a suffix or V*gei3* sequences are V-V compounds.

First, a word on terminology is needed. McCawley (1992: 227), using the same test of aspect attachment, has reached the same conclusion that V*gei3* is a verb.[1] Without giving any reasons, he also calls it a compound. Huang and Mo (1992), on the other hand, in treating *gei3* as a derivational suffix in V*gei3* compounds, may have confused the terminology. Affixing and compounding are two distinct processes; a compound, e.g., English *freeze-dry* and Mandarin *kan4jian4* (look-see) 'see', is generally considered a word formed by the combination of words or free morphemes (e.g., Liles 1975, Tatter 1986, Todd 1987, Starosta 1985: 251), while affixes, e.g., English *pre-* and *-ize* and Mandarin ordinal prefix *di4-* and plural suffix *-men*, are bound lexical formatives that are distinctively different from words or free morphemes that form compounds. Chi (1985: 38), for example, defines a compound in Chinese as a word that "consists of at least two morphemes *neither of which is affixal*" (emphasis added). Since Huang and Mo specifically argue for *gei3* as a suffix, they cannot consider V*gei3* as a case of compounding; in fact, Huang (1993: 363), citing Starosta's (1985: 251-252) position, does state explicitly that *gei3* is a suffix and that V*gei3* verbs should not be mischaracterized as compounds.[2]

Huang and Mo (1992) base their suffix account on four observations. First, *gei3* selects a (somewhat arbitrary) class of verbs. Secondly, V*gei3* sequences observe lexical integrity, and thirdly they may show semantic shift and idiosyncratic gaps. Fourthly, *gei3* introduces an additional goal role to the thematic structure of the verb V*gei3*. (I will show in 2.3 that *gei3* in fact selects a clearly definable class of verbs in V*gei3* compounds, but let's accept these observations for the moment.) None of these observations is inconsistent with *gei3* as the verb head in V*gei3* compounds. Compounding, which may or may not be productive, selects a class of lexical items and indeed has the capacity to alter the lexical semantics of predicates. On the other hand, there is substantial evidence available against the suffix analysis.

9.a. Li3si4 gei3 le ta1 yi1 duo3 hua1.
Lee give ASP she one CLS flower
Lee gave her a flower.

b. Li3si4 song4gei3 le ta1 yi1 duo3 hua1.
Lee give ASP she one CLS flower

Lee gave her a flower.

c.*Li3si4 gei3 le yi1 duo3 hua1 gei3 ta1.
Lee give ASP one CLS flower to she
Lee gave a flower to her.

d.*Li3si4 song4/diu1/mai3gei3 yi1 duo3 hua1 gei3 ta.
Lee give/toss/buy one CLS flower to she
Lee gave/tossed/bought a flower to her.

First of all, *gei3* is a free morpheme, a word, as shown in 9a. To pose it as a verb in compounds is thus straightforward, while to give it an additional suffix status as a bound morpheme would be a complication to the grammar. In addition, the thematic structure of verb *gei3* is consistent with that of a V*gei3* compound, compare 9a with 9b (or 7b and 8b). Both constructions have the thematic structure <ag go th> and denote the agent's volitional transfer of theme to goal. More importantly, *gei3*, as a ditransitive verb, is well-known for its inability to take a postverbal goal-marking *gei3* phrase, as in 9c, and it is the unique exception among all ditransitive verbs with thematic structure <ag go th>. With verb *gei3* as the head, all V*gei3* compounds, naturally, behave exactly the same in this regard, as seen in 9d. Also, the account for the non-occurrence of *gei3gei3* as a V*gei3* ditransitive verb is straightforward: verb *gei3* simply does not take itself in this compounding process. Why? Because the resulting form would not have any syntactic or semantic attribute that is different from verb *gei3* itself; thus, the application of the compounding process would be entirely vacuous.[3] For this same reason a V*gei3* verb also does not recycle and become V*gei3gei3*. An affixation analysis on the other hand offers no grammatical explanation to **gei3gei3* and must resort to haplology, a phonological constraint that arbitrarily rules out some adjacent identical elements (cf. Tang 1979, Teng 1985, Huang 1993).[4]

Phonological evidence, in fact, is also consistent with *gei3* as the head. *Gei3*, like other heads in compounds, such as *gan1xi3* [dry-wash] 'to dry-clean', *qian2jin4* [forward-advance] 'to move forward', and *man4pao3* [slowly-run] 'jog', retains its full tone, while suffixes (NOT prefixes!) typically reduce to the neutral tone, such as *chi1le* [eat-perfective suffix] 'have eaten', *wo3men* [I-human plural suffix] 'we', *xie2zi* [shoe-ZI suffix] 'shoe', and *fang2li* [house-inside] 'in the house'. That *gei3* retains its full tone as the head can be further confirmed by the fact that it induces the third-to-second tone sandhi in V*gei3* compounds, for example, *mai3gei3* in 8c becomes *mai2gei3* phonetically. Finally, I note that the right-headedness of V*gei3* compounds is also consistent with the compounds' semantic content as well as the general tendency within Chinese morphology.

Historically, many suffixes indeed have developed out of compounds, for example, derivational suffixes *-hood*, *-dom*, *-ly* in modern English that came from earlier compounds *cild-had* 'condition of a child', *freo-dom* 'realm of freedom', and *man-lic* 'body of a man' (Cowie 1995: 183). A prominent example in Chinese is the grammaticalization of Middle Chinese verb *liao3* 'finish' in V*liao3* compounds to modern perfective aspect suffix *-le*. As argued in Starosta (1985), Mandarin noun localizers have also become suffixes. However, as demonstrated above, I find no evidence indicating that *gei3* in V*gei3* compounds has reached this final stage of grammaticization.[5]

Finally one might suggest that it is the goal-marking preposition *gei3*, as in 2a, 7a, and 8a, that forms the V*gei3* compound. Available evidence is also in favor of a V-V over a V-P analysis. First of all, the existence of any V-P compound verb in Chinese is at best controversial, but V-V

compounding is a familiar and prolific word-formation process.[6] Furthermore, Huang and Mo (1992:110) are entirely correct in their observation that there is little theoretical motivation or empirical evidence for a PP position between a verb and its object. Thus, no structural model exists in the language for V*gei3* as V-P compounds. Another theoretical consideration is that V*gei3*'s thematic structure and syntactic behavior are exactly like those of verb *gei3*; this point will be discussed towards the end of 2.3.

2.2 Postverbal preposition *gei3*

Having established the proper compound status of V*gei3* verbs, I now turn to the controversial status of *gei3* in another postverbal construction, [V NP_1 *gei3* NP_2], as in 6 and examples of 2a, 7a, and 8a. Following Chao (1968), Huang and Mo (1992) argue ardently that here *gei3* is a verb and this thus is a serial verb construction. Between 10 and 11 below, 10 is thus the only valid analysis. I contend, however, if V subcategorizes for an oblique goal, then *gei3* indeed must be regarded as a goal-marking preposition, otherwise a verb. In other words, 10 and 11 are both valid.

10. [V NP [$_{VP}$ [$_{V}$ *gei3* $_{V}$] NP] $_{VP}$]
11. [V NP [$_{PP}$ [$_{P}$ *gei3* $_{P}$] NP] $_{PP}$]

The many arguments for construction 10 that Huang and Mo (1992) put forth are rather unnecessary, for it is a given that *gei3* is a verb, as in 9a. Like any other active verb then, such as *song4* or *song4gei3* 'give' in 12a, *gei3* of course can be the second verb in a serial verb construction, as in 12b.

12.a. Li3si4 mai3 le yi1 duo3 hua1 [$_{V}$ song4(gei3) $_{V}$] ta1.
Lee buy ASP one CLS flower give she
Lee bought a flower to give to her.

b. Li3si4 mai3 le yi1 duo3 hua1 [$_{V}$ gei3 $_{V}$] ta1.
Lee buy ASP one CLS flower give she
Lee bought a flower to give to her.

The question is, however, given 12b, whether construction 11 is also valid; after all, *gei3*, much like *zai4*, is well-recognized as a preposition preverbally, as in 13a-b. Note first that a post-object PP position is independently motivated for subcategorized oblique locative roles, as in 14a. Therefore, by allowing a subcategorized *gei3*-marked goal in the post-object PP position, as in 14b, construction 11 complicates neither the analysis of *gei3* nor the overall grammar. Quite the contrary, it generalizes the post-object PP position to all locus-like roles, i.e., those that indicate the terminus point of the theme.[7]

13.a. Li3si4 [$_P$ zai4 $_P$] jie1shang mai3 le yi1 duo3 hua1.
Lee at street-top buy ASP one CLS flower
Lee bought a flower on the street.

b. Li3si4 [$_P$ gei3 $_P$] ta1 mai3 le yi1 duo3 hua1.
Lee for he buy ASP one CLS flower
Lee bought a flower for her.

14.a. Li3si4 diu1 le yi1 duo3 hua1 [$_P$ zai4 $_P$] zuo1shang.
Lee toss ASP one CLS flower at table-top
Lee tossed a flower on the table.

b. Li3si4 diu1 le yi1 duo3 hua1 [$_P$ gei3 $_P$] ta1.
Lee toss ASP one CLS flower to she
Lee tossed a flower to her.

The central issue for the validation of construction 11, as in 14b, is thus whether a subcategorized goal may indeed be realized as an oblique function, thus a PP, in Chinese. Let's examine the structures of two ditransitive verbs, *song4* 'give' and *jie4* 'lend', which, with no controversy, subcategorize for a goal role.

15.a. Li3si4 song4 ta1 yi1 duo3 hua1.
Lee give she one CLS flower
Lee gives her a flower.

b. Li3si4 jie4 ta1 yi1 duo3 hua1.
Lee lend she one CLS flower
Lee lends her a flower.

The underlined NP is the subcategorized goal in the predicate thematic structure <ag go th> of these verbs. Here goal is realized as a secondary object, traditionally known as indirect object, generally considered the most marked grammatical relation, which many languages lack (e.g., Bresnan and Zaenen 1990). Hence the unmarked choice for goal is to link to the less marked oblique relation in the same language, which is precisely borne out by my proposal to recognize construction 11 for 16a-b below, where preposition *gei3* marks the subcategorized goal. By linking a subcategorized goal to the most marked secondary object only, and never to the less marked oblique function, Huang and Mo's analysis violates this universal tendency.[8] This stipulation is dubious in that no other roles in the language behave this way.

16.a. Li3si4 song4 yi1 duo3 hua1 gei3 ta1.
Lee give one CLS flower to she
a' Lee gives a flower to her.

b. Li3si4 jie4 yi1 duo3 hua1 gei3 ta1.
Lee lend one CLS flower to she
b' Lee lends a flower to her.

Also, within my analysis, verbs in 15a-b and 16a-b, are related by the same thematic structure <ag go th>, with goal alternatively mapped to a secondary object NP and an oblique PP. Goal-marking preposition *gei3* and English goal-marking *to* and *for* are therefore exactly parallel. Not recognizing goal-marking preposition *gei3*, Huang and Mo (1992:114) treat *gei3* as a verb and consequently the VP *gei3 ta1* in 16 as an adjunct. This analysis renders 15a-b and 16a-b different in thematic structure, <ag go th> and <ag th> respectively, while 15a-b and 16a-b are in fact identical in meaning with only slight variation of focus (cf., Cheng 1983).

There is also empirical evidence that [*gei3* NP] in 16a-b is a subcategorized constituent, not an adjunct. Subcategorized constituents tend to be obligatory and associated with semantic roles that are ontologically necessary for a complete proposition (e.g., Pollard and Sag 1987, Her 1990). Although Chinese, unlike English, allows greater freedom of missing arguments, 16a-b, without the goal constituent, do seem incomplete, as shown in 17a-b (cf., Her 1990).

17.a.?Li3si4 song4 yi1 duo3 hua1.
Lee give one CLS flower
a'?Lee gives a flower.

b.?Li3si4 jie4 yi1 duo3 hua1.
Lee lend one CLS flower
b'?Lee lends a flower.

More importantly, a subcategorized argument identifies a subcategory of predicates (e.g., Huang 1989, Her 1990). As shown with 16a-b, *gei3*-marked goal constituent indeed identifies a class of verbs in Chinese that have thematic structure of <ag go th>; besides *song4* 'give' and *jie4* 'lend', other such verbs include *shang3* 'bestow', *huan2* 'return', *ti2gong1* 'provide', *zu1* 'rent', *ji4* 'mail', *jiao1* 'hand in', *mai4* 'sell', *di4* 'hand', and *chuan2* 'pass'. Some of them alternate between the ditransitive dative construction, as in 19, and the *gei3*-marked PP construction, as in 11 (repeated here as 18), while others do not and allow construction 18 only. The important point is that post-object *gei3*, as a preposition, marks the subcategorized goal and selects the subcategory of verbs that have thematic structure <ag go th>. (As mentioned earlier, the verb *gei3* 'give' is of course well-known as the only exception, which appears in 19 but not 18; see 9a and 9c above. I will discuss this further in 2.3 and 2.4.)

18. [V NP_1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] NP_2 $_{PP}$]]
19. [V NP_2 NP_1]

Recall, however, construction 10 is recognized along with 11 (repeated as 18), where [*gei3* NP] is a VP adjunct and a subcategorized PP respectively. One might criticize this dual status as creating two ambiguous structures. Given the principle of subcategorization, nonetheless, 20a is ruled out for dative verbs, because the subcategorized goal can not be found in this construction.[9]

20.a.*Li3si4 song4 yi1 duo3 hua1 [$_{VP}$ [$_{V}$ *gei3* $_{V}$] ta1 $_{VP}$]].
b. Li3si4 song4 yi1 duo3 hua1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] ta1 $_{PP}$]].

On the other hand, for verbs that do not subcategorize for a goal role, construction 10 is the only grammatical analysis. The principle of subcategorization rules out 11, which contains a subcategorizable PP that is not subcategorized for by the predicate.[10] *Diu1chu1* 'toss out' in 21a-b and *mai3xia4* 'buy' in 22a-b for example subcategorize for agent and theme, but not goal, and thus rule out construction 11.

21.a. Li3si4 diu1chu1 le yi1 duo3 hua1 [$_{VP}$ [$_{V}$ *gei3* $_{V}$] ta1 $_{VP}$]].
Lee toss-out ASP one CLS flower give she
Lee tossed out a flower to give to her.

b.*Li3si4 diu1chu1 le yi1 duo3 hua1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] ta1 $_{PP}$]].

22.a. Li3si4 mai3xia4 le yi1 duo3 hua1 [$_{VP}$ [$_{V}$ *gei3* $_{V}$] ta1 $_{VP}$]].
Lee buy-down ASP one CLS flower give she
Lee bought a flower to give to her.

b.*Li3si4 mai3xia4 le yi1 duo3 hua1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] ta1 $_{PP}$]].

There are, however, transitive verbs that optionally subcategorize for an additional goal. For such verbs, e.g., *diu1* 'toss', *ti1* 'kick', *mai3* 'buy', *mai4* 'sell', *xie3* 'write', and *ji4* 'mail', [*gei3* NP] may indeed be ambiguous between a VP and a PP. The thematic structure of 23a and 24a is <ag th> with [*gei3* NP] being a modifying VP adjunct, while the thematic structure of 23b and 24b is <ag go th>, where goal is linked to [*gei3* NP], a PP.

23.a. Li3si4 diu1 le yi1 duo3 hua1 [$_{VP}$ [$_{V}$ *gei3* $_{V}$] ta1 $_{VP}$]].
Lee toss ASP one CLS flower to she
Lee tossed a flower to give to her.

b. Li3si4 diu1 le yi1 duo3 hua1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] ta1 $_{PP}$]].
Lee tossed a flower to her.

24.a. Li3si4 mai3 le yi1 duo3 hua1 [$_{VP}$ [$_{V}$ *gei3* $_{V}$] ta1 $_{VP}$]].
Lee buy ASP one CLS flower give she
Lee bought a flower to give to her.

b. Li3si4 mai3 le yi1 duo3 hua1 [$_{PP}$ [$_{P}$ *gei3* $_{P}$] ta1 $_{PP}$]].
Lee bought a flower for her.

Note, however, this kind of ambiguity between an argument, thus a subcategorized constituent, and an adjunct is not at all uncommon in languages, and the preferred reading is generally the one with the subcategorized constituent.[11] English locomotive verbs, for example, optionally subcategorize for a locative role. 25a thus has two readings analogous to 25b and 25c, where the locational PP is an argument and an adjunct respectively (e.g., Bresnan 1989), and the preferred reading is also clearly that of the locational argument, i.e., 25b.

25.a. Lee jumped in the pool.
b. In the pool jumped Lee.
c. In the pool, Lee jumped.

In short, two points are established so far: 1) V*gei3* is a compound verb, where *gei3* is the head, and 2) post-object *gei3* is a goal-marking preposition if the predicate subcategorizes for goal, otherwise a verb heading a VP adjunct.[12] I will now bring these two analyses together to reveal a class of verbs that form V*gei3* compounds.

2.3 A semantically definable class of Verbs for V*gei3* Compounds

Huang and Mo (1992:111-113) argue that the verbs that may form V*gei3* compounds, though known to be a subset of transitive verbs, cannot be independently defined. Although it is true that compounding may often have idiosyncratic gaps, it is not a necessary condition. V*gei3* compounding is productive in that it applies to new or possible verbs in the language, a fact that even Huang and Mo (1992:111) acknowledge. For example, temporarily-borrowed transitive verbs from English like *telex*, *fax*, *mail*, or *pass* in 26a do form V*gei3* ditransitive verbs, as in 26b.

26.a. Li3si4 FAX/TELEX/PASS le yi1 fen4 wen2jian4.
Lee ASP one CLS document
Lee faxed/telexed/passed a document.

b. Li3si4 FAX/TELEX/PASSgei3 le ta1 yi1 fen4 wen2jian4.
Lee ASP she one CLS document
Lee faxed/telexed/passed her a document.

No doubt influenced by their view that disallows *gei3*-marked postverbal PP goal, Huang and Mo have overlooked the fact that all of the transitive verbs that form V*gei3* compounds, existing or possible, without exception, can also take a goal role marked by preposition *gei3*, as in 27a. Likewise, those that do not form V*gei3* compounds also do not allow *gei3*-marked goal, as in 27b-c.

27.a. Li3si4 FAX/TELEX/PASS le yi1 fen4 wen2jian4 gei3 ta1.
Lee ASP one CLS document to she
Lee faxed/telexed/passed a document to her.

b.*Li3si4 chi1/he1/xiao1hua4 le yi1 wan3 tang1 gei3 ta1.
Lee eat/drink/digest ASP one bowl soup to she

c.*Li3si4 chi1/he1/xiao1hua4-gei3 le ta1 yi1 wan3 tang1.
Lee eat/drink/digest ASP she one bowl soup

This indicates that the class of verbs that verb *gei3* selects in V*gei3* compounds can be quite clearly defined as those sharing *gei3*'s thematic structure <ag go th>. Since only a rather small subset of verbs that subcategorize for a *gei3*-marked goal are ditransitive verbs (i.e., they allow construction 10, [V NP_2 NP_1]), construction 11, [V NP_1 [$_{PP}$ [$_P$ *gei3* $_P$] NP_2 $_{PP}$]], remains the only reliable test for a verb as to whether it forms a V*gei3* compound. In other words, 10 is a sufficient condition but not a necessary one, while 11 is both sufficient and necessary.

28. Gei-compounding:
V_i<ag go th>+[$_V$*gei3*$_V$] → V_i*gei3*<ag go th>
Test: [V_i NP_1 [$_{PP}$ [$_P$ *gei3* $_P$] NP_2 $_{PP}$]]

I will now repudiate the two cases that Huang and Mo (1992:112) claim to be counter-examples to this generalization. One, they claim that the active/stative distinction is irrelevant to the class of V*gei3* compounds, for even the stative verb *guan4* 'to carry (a name)', as in 29a, forms a *guan4gei3* compound, as in 29b. There are two relevant facts they have overlooked here. First, *guan4* may be both stative and active, as shown in 29a and 29c respectively. Secondly, as an active verb, *guan4* indeed subcategorizes for goal and appear in construction 11, as shown in 29c. It is,

therefore, the active *guan4* with thematic structure <ag go th>, not the stative one, that combines with verb *gei3* to form the compound in 29b.

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29.a. Ta1 guan4 fu1xin4.
      she carry husband-surname
      She carries her husband's surname.

   b. Ta1 guan4gei3 li3si4 yi1 ge  wai4hao4.
      she name-give Lee    one CLS nickname
      She gave Lee a nickname.

   c. Ta1 guan4 le  yi1 ge  wai4hao4 gei3 li3si4.
      she name  ASP one CLS nickname to   Lee
      She gave a nickname to Lee.
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Huang and Mo (1992:112) also produce verbs like *shuo1* 'say' and *gao4su4* 'tell' as counter-examples. Although these *say*-type verbs do subcategorize for a goal-like role, they do not subcategorize for a theme-like role; instead, they require a proposition, as evident in 30a-b. This proposition role may be expressed by an S or a reduced VP, as in 30a-b, or a *statement*-type noun, as in 31a-b. Thus, *say*-type verbs, with thematic structure <ag go prop>, do not subcategorize for theme. Predictably then they do not allow a *gei3*-marked PP goal, as shown in 32a-b, as thus fail the test for V*gei3* compounding (32c-d).

```
30.a. Li3si4 dui4 ta1 shuo1 tian1qi4 bu4 hao3.
      Lee    to   she say   weather  not good
      Lee said to her that the weather was not good.

   b. Li3si4 gao4su4 ta1 bu2 qu4 le.
      Lee    tell    she not go  PTCL
      Lee told her that he wasn't going anymore.

31.a. Li3si4 dui4 ta1 shuo1 le  yi1xie1 hao3hua4.
      Lee    to   she say   ASP some    nice-words
      Lee said some nice things to her.

   b. Li3si4 gao4su4 ta1 yi1xie1 mi4mi.
      Lee    tell    she some    secret
      Lee told her some secrets.

32.c.*Li3si4 shuo1 le  yi1xie1 hao3hua4   gei3 ta1.
      Lee    say   ASP some    nice-words to   sh2
      Lee said some nice things to her.

   d.*Li3si4 gao4su4 yi1xie1 mi4mi  gei3 ta1.
      Lee    tell    some    secret to   her
     ?Lee told some secrets to her.

   c.*Li3si4 shuo1gei3 le  ta1 yi1xie1 hao3hua4.
      Lee    say       ASP she some    nice-words
      Lee said some nice things to her.
```

d.*Li3si4 gao4su4gei3 ta1 yi1xie1 mi4mi.
Lee tell she some secret
?Lee told some secrets to her.

It is therefore my conclusion that verb *gei3*, as the head, selects a well-defined class of verbs in V*gei3* compounding, i.e., verbs that share its thematic structure <ag go th>. Within this coherent analysis the behaviors of V*gei3* compound receives a logical explanation: a V*gei3* compound, formed by verb *gei3* and another verb of the same thematic structure, syntactically behaves just like *gei3*. Recall that *gei3*, the only exception in the class of verbs of thematic structure <ag go th>, requires the double object construction (19), and does not allow a *gei3*-marked goal PP (18). The resulting compound verb V*gei3* inherits this restraint and thus quite naturally allows an indirect object only, not a *gei3*-marked PP. This also provides another motivation for favoring the V-V analysis over the V-P analysis of V*gei3* compounds discussed at the end of 2.2. Within the V-P analysis or a suffix analysis, such a coherent account of V*gei3* compounds' syntactic behavior is unattainable.

2.4 Three Subtypes of <ag go th> Verbs

It has been shown that goal-marking preposition *gei3* and English dative *to* are exactly parallel. However, not all verbs of thematic structure <ag go th> in Chinese alternate between an oblique function and an indirect object. The two constructions of dative shift are repeated here as 33 and 34 respectively. 33 and 34 are thus two surface syntactic structures related to each other by the same thematic structure <ag go th>. Accordingly, <ag go th> verbs can be classified into three subtypes (cf., Tang 1979, Huang 1995).

33. Goal linked to an oblique PP: [V NP_1 [$_P$ *gei3* $_P$] NP_2
34. Goal linked to an indirect object: [V NP_2 NP_1]

The First Type: e.g., *ji4* 'mail', **jiao1** 'hand in', *mai4* 'sell', *di4* 'hand', *chuan2* 'pass', *ti1* 'kick', *diu1* 'toss'. These are <ag go th> verbs that allow surface structure 33 but not 34, as demonstrated below in 35.

35.a. Li3si4 di4 le yi1 duo3 hua1 gei3 ta1.
Lee hand ASP one CLS flower to she
Lee handed a flower to her.

b.*Li3si4 di4 le ta1 yi1 duo3 hua1.
Lee hand ASP she one CLS flower
Lee handed her a flower.

Since the indirect, or secondary, object, i.e., NP_2 in 34, is the most marked grammatical relation in languages, it is expected that the default function for goal is an oblique function. This type of verbs thus allow the most direct linking between its thematic structure and surface syntactic functions.

The Second Type: e.g., *song4* 'give', *jie4* 'lend', *shang3* 'bestow', *ti2gong1* 'provide', *zu1* 'rent', and *huan2* 'return'. Verbs here, compared with type one, are far fewer; they allow the alternation between 33 and 34, as in 36a-b below.

36.a. Li3si4 song4 le yi1 duo3 hua1 gei3 ta1.

Lee give ASP one CLS flower to she
Lee gave a flower to her.

b. Li3si4 song4 le ta1 yi1 duo3 hua1.
Lee give ASP she one CLS flower
Lee gave her a flower.

The Third Type: e.g., *gei3* 'give', *song4gei3* 'give', *diu1gei3* 'toss', *mai3gei3* 'buy', and *FAXgei3*. As shown in 37a-b, verb *gei3*, along with all V*gei3* compounds, is unique among <ag go th> verbs in that it requires an indirect object and does not allow its subcategorized goal to be linked to a *gei3*-marked oblique function.

37.a.*Li3si4 (song4)gei3 le yi1 duo3 hua1 gei3 ta1.
Lee give ASP one CLS flower to she
Lee gave a flower to her.

b. Li3si4 (song4)gei3 le ta1 yi1 duo3 hua1.
Lee give ASP she one CLS flower
Lee gave her a flower.

Note, as mentioned earlier in 2.3, the *say*-type verbs, e.g., *shuo1* 'say', *gao4su4* 'tell', *wen4* 'ask', *qing3jiao4* 'ask', *jiao1* 'teach', and *jiang3* 'say, tell', only superficially behave similarly as the third type here. They allow an indirect object but not a *gei3*-marked PP (cf., Tang 1979, Huang 1995). As argued earlier, however, these verbs have a different thematic structure, <ag go prop>, and as such they are not relevant in this classification scheme for verbs of <ag go th>. Likewise, there is another class of verbs that also seem to behave like the type three verbs here. They include *chi1* 'eat', *he1* 'drink', *zhuan4* 'earn', *fa2* 'fine', *qiang3* 'rob', *tou1* 'steal', *qian4* 'owe', *hua1* 'spend', etc (cf., Tang 1979, Huang 1995). For example,

38.a.*Li3si4 chi1 le yi1 zhi1 ji1 gei3 ta1.
Lee eat ASP one CLS chicken to she
(To her dislike,) Lee ate a chicken of hers.

b. Li3si4 chi1 le ta1 yi1 zhi1 ji1.
Lee eat ASP she one CLS chicken
(To her dislike,) Lee ate a chicken of hers.

Although these verbs share the same constituent structure [V NP NP] as type three <ag go th> verbs, they do not have thematic structure <ag go th> either and thus have no place in this classification. Rather, they subcategorize for a patient (pt) role, which is linked to the primary object. Thus they have thematic structure <ag pt th> instead. In 39, then, *ta1*, as patient and the primary object, can be passivized (39a) and appear in the ba-construction (39b), unlike goal and a secondary object (see example 40b in 2.5 and 39c).

39.a. Ta1 bei4 Li3si4 chi1 le yi1 zhi1 ji1.
she by Lee eat ASP one CLS chicken
(To her dislike), she had a chicken eaten by Lee.

b. Li3si4 ba3 ta1 chi1 le yi1 zhi1 ji1.
she by BA Lee eat ASP one CLS chicken
(To her dislike,) Lee ate a chicken of hers.

c.*Li3si4 ba3 ta1 song4 le yi1 zhi1 ji1.
she by BA she give ASP one CLS chicken
Lee gave her a chicken.

2.5 Interaction of Dative shift and Passive

In passive constructions, verbs of thematic structure <ag go th> display interesting variance between Chinese and English. Chinese strictly forbids the passivization of goal and allows only theme to be passivized, while both goal and theme are passivizable in English.

40.a.*Ta1 (bei4 Li3si4) diu1 le yi1 duo3 hua1.
she by Lee toss ASP one CLS flower
a' She was tossed a flower (by Lee).

b.*Ta1 (bei4 Li3si4) gei3 le yi1 duo3 hua1.
she by Lee give ASP one CLS flower
b' She was given a flower (by Lee).

c. Hua1 (bei4 Li3si4) diu1 le gei3 ta1.
flower by Lee toss ASP to she
c' The flower was tossed to her (by Lee).

d. Hua1 (bei4 Li3si4) gei3 le ta1.
flower by Lee give ASP she
d'%The flower was given her (by Lee).[13]

3. A LEXICAL MAPPING IMPLEMENTATION

The analysis and observations presented in section 2 will be implemented within LFG's lexical mapping theory (LMT). The theory of lexical mapping is presented 3.1, where two previous standard versions are presented and proposed revisions discussed. In 3.2 I then provide a formal account for the analyses in section 2, within the revised LMT I propose.

3.1 The Lexical Mapping Theory

An essential theoretic assumption of LFG is that the lexical semantic structure, the relational structure of grammatical functions (or f-structure), and the structure of phrasal constituents (or c-structure), are parallel autonomous planes of grammatical organization related by local structural correspondences, the same way a melody of a song relates to its lyrics (Bresnan and Kanerva 1989, BK henceforth). The lexical mapping theory is the part of LFG that constrains the correspondence between the lexical semantic structure the lexical forms of a predicate, as shown in Fig. 1 below. In other words, it links thematic roles, e.g., agent and theme, to grammatical functions (GF's), e.g., SUBJ and OBJ.

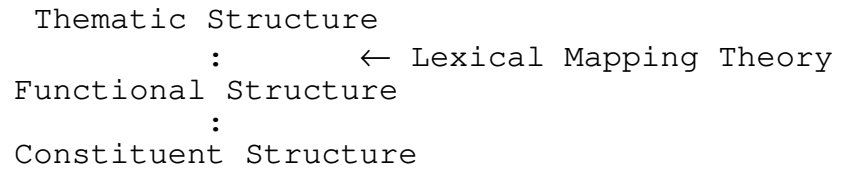

Fig. 1. LFG Grammatical Representation

The details of LMT were first introduced in BK in a systematic manner. A different version was later presented in Bresnan and Zaenen (1990) (BZ henceforth). In this paper, however, I will adopt the revised version proposed in Her (1997ms). First of all, LMT assumes two universal hierarchies of thematic roles and grammatical functions, or GF's in short, shown in 41 and 42.

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

42. Markedness Hierarchy of GF's:
SUBJ ↓
OBJ/OBL$_\Theta$ ↓
OBJ$_\Theta$ more marked

The thematic hierarchy assumes a descending order of prominence among semantic arguments in language, while among the GF's, SUBJ is ranked the least marked and OBJ$_\Theta$ the most marked. Note however, 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 43.

43. Classification of GF's:
SUBJ [-r -o] OBL$_\Theta$ [+r -o]
OBJ [-r +o] OBJ$_\Theta$ [+r +o]

The lexical mapping theory proposed in Her (1997 ms) consists of two components: the theory of a-structure (44) and a single mapping principle (45).

44. The theory of a-structures:
a. intrinsic classifications (IC's):
pt [-r]; secondary pt → [+o]; ag → [-o]
b. morpholexical operations:
e.g., (Eng/Chi) locative inversion:
<th loc> → <th[+o] loc[-r]> (HH)
c. default classifications (DC's):
ê [-r]; all others → [+r]

45. The mapping principle (MP):
For each role in a-structure that has no higher role not linked to a GF, map it to the least marked compatible GF not associated with any higher role.

3.2 LMT Account of dative shift and passive

It is plainly obvious that within the LMT proposed above the only component that allows language-specific syntactic assignments is morpholexical operations. Given the analysis of dative shift that verbs of thematic structure <ag go th> alternate between two surface syntactic patterns, LMT dictates that a morpholexical rule is responsible for this function-changing operation.

46. Dative (Eng & Chi): go → [+o]

Since Chinese and English are parallel in this construction, the same dative operation accounts for both languages. As shown in 47a below, goal is mapped to an oblique function marked by a semantically restricted preposition *gei3* or *to*. Note that although in the a-structure goal[+r] and theme[-r] are both underspecified, the MP correctly links them to the appropriate GF's. The ditransitive verbs, on the other hand, have an a-structure that undergoes the morpholexical operation of Dative, go +o; as shown in 47b, the addition of this syntactic feature also predicts correctly the same dative functional structure for the two languages.

```
47.a.  song4/give < ag     go     th >
    IC's            -o           -r
    DC's            -r     +r
  ------------------------------------------
    GF Class.      SUBJ OBL_θ/OBJ_θ  S/O
    MP             SUBJ   OBL_θ     OBJ

    Li3si4 song4 le yi1 ben3 shu1 gei3 ta1.
    Lee gave a flower to her.

   b.  song4/give < ag     go     th >
    IC's            -o           -r
    Dative                 +o
    DC's            -r     +r
  ------------------------------------------
    GF Class.      SUBJ   OBJ_θ     S/O
    MP             SUBJ   OBJ_θ     OBJ

    Li3si4 song4 le ta1 yi1 duo3 hua1.
    Lee gave her a flower.
```

While previous LFG accounts of dative alternation operate on lexical forms and derive lexical forms from lexical forms (e.g., cf., Bresnan 1982b: 43-45), lexical mapping relates the two alternative lexical forms *song4*<SUBJ OBL$_\theta$ OBJ> and *song4*<SUBJ OBJ$_\theta$ OBJ> to a single source, *song4*<ag go th>. However, the Dative operation proposed here does reveal the intuition that previous accounts of syntactic derivation or lexical derivation were able to capture, namely that the lexical form associated with an a-structure unaffected by morpholexical rules is more basic, unmarked, while lexical forms linked to a-structures affected by morpholexical operations are 'derived' or relatively more marked.

In 2.4, verbs of thematic structure <ag go th> are further distinguished among three types; each type can now be identified by its relationship with the Dative rule. The first type of verbs, which do not allow the ditransitive construction, are not marked for the Dative rule. Thus, their thematic structure <ag go th> maps to lexical form <SUBJ OBJ OBL$_\theta$ > only. Verbs of the second type, which do allow the ditransitive construction, are marked for an optional Dative. Two lexical

forms arise from the thematic structure: <SUBJ OBJ OBL_Θ > and <SUBJ OBJ_Θ OBJ>, related to each other by the same thematic structure and the Dative morpholexical rule. Finally, the third type, i.e., verb *gei3* and V*gei3* compounds, which appears only in the ditransitive construction, is marked for an obligatory Dative and has lexical form <SUBJ OBJ_Θ OBJ> only.

Table 1. Lexical Forms of <ag go th> Verbs

	Dative	<SUBJ OBJ OBL_Θ>	<SUBJ OBJ_Θ OBJ>	
TYPE 1	N/A	+	−	diu1 'toss'
TYPE 2	Optional	+	+	song4 'give'
TYPE 3	Obligatory	−	+	gei3 'give'

Following the analysis in section 2 of V*gei3* compounds and the Gei-compounding rule (28), repeated here, all V*gei3* compound verbs also undergo the dative operation obligatorily, which is quite reasonable since verb *gei3* as the head is independently marked for obligatory Dative. Or, to use Alsina's (1994) term, *gei3*, as the head, carries over its Dative 'lexical option' to V*gei3* compounds.

48.

	diu1gei3	< ag	go	th >	'toss'
	IC's	−o		−r	
	Dative		+o		
	DC's	−r	+r		
	GF Class.	SUBJ	OBJ_Θ	S/O	
	MP	SUBJ	OBJ_Θ	OBJ	

Li3si4 diu1gei3 le ta1 yi1 duo3 hua1.
Lee tossed her a flower.

Passive, however, as shown in 2.5, is different between Chinese and English. Chinese passive is more restricted in that goal cannot be passivized. The passive operations (49) that I propose for Chinese thus assign [+r] to goal, if there is one, besides suppressing the highest role. The [+r] feature ensures the linking of goal to a semantically restricted non-subject GF.

49. (Chinese) Passive: < ..(go)..>
↓
[+r]

Example 50 shows that this rule correctly predicts the two lexical forms of passivized <ag go th> verbs in Chinese. The ungrammatical 51, where goal is the passivized subject, does not have a valid mapping. The interaction of dative and passive in Chinese is shown in 52; again, it correctly accounts for the grammatical sentences and rules out the ill-formed 53.[14]

50.

	diu1	< ag	go	th >
	IC's	−o		−r
	Passive		+r	
	DC's			

GF Class.		OBL_θ/OBJ_θ	S/O
MP		OBL_θ	SUBJ

Hua1 (bei4 Li3si4) diu1 le gei3 ta1.
The flower was tossed to her (by Lee).

51.*Ta1 (bei4 Li3si4) diu1 le yi1 duo3 hua1.
She was tossed a flower by Lee.

52.	gei3 <	ag	go	th >
IC's		-o		-r
Dative			+o	
Passive			+r	
DC's				
GF Class.			OBJ_θ	S/O
MP			OBJ_θ	SUBJ

Hua1 (bei4 Li3si4) gei3 le ta1.
The flower was given her (by Lee).

53.*Ta1 (bei4 Li3si4) gei3 le yi1 duo3 hua1.
She was given a flower (by Lee).

Since in English passive the goal role may or may not be the subject, the passive operations (54) assign an optional [+r] to goal, while in Chinese passive the goal role must be [+r]. Example 55a demonstrates that goal is the passivized subject if goal opts for the default classification. With agent suppressed, goal is the highest role in the a-structure and receives [-r] as a DC; theme receives [-r] also as an IC. MP, however, maps goal, the higher role, to SUBJ, and thus makes it unavailable for theme. 55b shows that, like Chinese, goal is set to [+r], which leaves theme as the only candidate for subjecthood.

54. (English) Passive: < ..(go)..>
↓
([+r])

55.a.	give <	ag	go	th >
IC's		-o		-r
Passive				
DC's			-r	
GF Class.			S/O	S/O
MP			SUBJ	OBJ

She was given a flower (by Lee).

```
 b.          give < ag      go      th >
  IC's              -o              -r
  Passive                   +r
  DC's
-------------------------------------------
  GF Class.             OBL_θ/OBJ_θ   S/O
  MP                       OBL_θ      SUBJ

  A flower was given to her (by Lee).
```

English passive, like its Chinese counterpart, also interacts with dative. Since goal alternates between [+r] and [-r] due to passive but is restricted to be [+o] by dative, it appears either as an object (56a) or a secondary object (56b), although the two sentences share an exactly identical c-structure. Note that there is no particular order of application between dative and passive.

```
56.a.        give <  ag      go       th >
    IC's             -o              -r
    Dative                  +o
    Passive
    DC's                    -r
  ------------------------------------------
    GF Class.               OBJ_θ      S/O
    MP                      OBJ_θ      SUBJ

    %A flower was given her (by Lee).

  b.          give < ag      go       th >
    IC's             -o              -r
    Dative                  +o
    Passive                 +r
    DC's
  ------------------------------------------
    GF Class.               OBJ_θ      S/O
    MP                      OBJ_θ      SUBJ

    %A flower was given her (by Lee).
```

Sentences like 56, although deemed unacceptable by prescriptive grammarians, are quite acceptable in some dialects of English (e.g., Jaeggli 1986: 596, Anderson 1988: 300, Dryer 1986: 833). Note that its counterpart in Chinese, 52, is quite acceptable as well. A satisfactory account ideally provides a reasonable explanation and parameter for this variation, not simply rules it out or rules it in. Note first that an unmarked NP in the c-structure position immediately following the verb may indeed encode either OBJ or OBJ_θ, see the following c-structure rule.

```
57. VP → V      NP*          PP*      (S')
         ↑OBJ/OBJ_θ=↓   ↑OBL_θ=↓   ↑COMP=↓
```

The resulting dual status of OBJ_θ and OBJ associated with the goal NP thus creates two analyses, or two f-structures more specifically, and thus may present a difficulty in processing. Also, it is a highly marked construction in the sense that dative and passive must both apply to yield this construction. Therefore, for speakers who do not accept such sentences, it can be stipulated that dative and passive do not jointly apply to the same thematic structure.

In short, the parameterization of the passive operation (go→ [+r]) as optional or obligatory accounts for the whole range of behavior regarding the goal role in passive constructions in English and Chinese and the variation between the two languages.

4. CONCLUSION

A moderate aim of this paper is to provide a coherent, formalized analysis of Chinese dative shift, *gei3* as a verb and a goal-marking preposition, the proper status of V*gie3* sequences, and verbs with thematic structure <ag go th>. To that aim, I have demonstrated that Chinese has a parallel dative shift as English in that post-object *gei3* may indeed be a semantically restricted preposition encoding a subcategorized oblique function. I have also shown that the prolific V*gei3* verbs are V-V compounds where *gei3* is the head, not a suffix, and selects the class of <ag go th> verbs. The completely identical syntactic behavior between V*gei3* verbs and verb *gei3* thus receive a natural explanation.

A more ambitious aim is to use this analysis to test the validity of a revised lexical mapping theory proposed in Her (1997 ms), where the overall strategy is to maximize the universality of the theory. To accomplish that, all components of the theory are designed to be language-independent, except morpholexical operations, which are extended the capacity of assigning syntactic features to accommodate function-changing lexical processes that do not affect the lexical semantics of predicates. Within the revised LMT, identical structures of dative shift in Chinese and English receive an identical account. The two languages differ however in that English allows passivized goal and Chinese does not. This variation is accounted for with a single parameter in passive operations: Chinese goal receives a [+r] and maps only to semantically restricted functions, whereas in English this syntactic assignment is optional and thus passivized goal is allowed.

The nature of LMT is clearly that of an interface; it links the information of lexical semantics and that of syntactic structure, two distinct parallel planes, and thus has access to information at both planes. Having the language-specific morpholexical module interact with other universal modules, our account at least partially captures the insight that languages diverge and converge at the same time (e.g., Hsieh 1995) and provides a fertile ground for the study of syntactic variations. This LMT view also supports the relativist position that languages (and the various constructions within a single language) vary in degree in terms of iconicity (e.g., Tai 1992, Tai 1993, Hsieh 1993), with high iconicity taken to be a direct mapping between the lexical semantic structure and the surface syntactic structure with little or no mediation of morpholexical operations such as dative and passive.

NOTES

1. Both Huang and Mo (1992) and McCawley (1992) also use data that involve ellipsis of the NP following *gei3* to show that *gei3* cannot be a preposition in V-*gei3* sequence. The following 58 and 59 are from McCawley (1992: 227), 60 from Huang and Mo (1992: 111).

```
58. Wo3 fu4gei3 $200 de   nei4 ge  ren2.
    I   pay     $200 COMP that CLS person
```

The person whom you paid $200.

59. Nei4 ge ren2, wo3 fu4gei3 $200.
that CLS person I pay $200
That person, you paid $200.

60. ...di4gei3 yi1 er4 qian1 yuan2 de xiao3fei4.
hand-out one two thousand dollar DE tip
Handing out tips of one or two thousand dollars.

However, all of the dozen or so native speakers I have checked with find such sentences difficult to accept. Huang and Mo (1992: 114), citing Huang (1992), actually got it right with the observation that "Mandarin does not allow indirect object gap in general". Their example above is thus self-contradictory. Such evidence is not necessary for the positive identification of verbhood, for not all verbs allow immediate NP ellipsis.

2. Note that Starosta (1985) does not specifically discuss whether V*gei3* is a case of compounding or suffixing. In fact, he is quite emphatic about the point that a compound is composed of two or more words (Starosta 1985: 251). Accordingly, he argues against treating localizer attachment in Mandarin as a case of compounding since localizers such as *-li3* 'inside', *-wai4* 'outside', and *-shang4* 'surface' are arguably no longer words or free morphemes in modern spoken Chinese. By this criterion, V*gei3* must be recognized as compounding since both V and *gei3* are words individually.

3. Note also that reduplication is a fairly productive word-formation process of Mandarin active verbs indicating tentativeness (e.g., Li and Thompson 1981).

61. Chang2chang2-kan4 zhei4 ge tang1, gou4 xian2 ma1?
taste-see this CLS soup enough salty PTCL
Try taste the soup, is it salty enough?

62. Zhei4 zhong3 shu1, ni3 gei3gei3-kan4, mei2 ren2 yao4 de.
this kind book you give-see no person want DE
This kind of books, you can try and give them out, no one'll want them.

Thus, given the pressure for a transparent one-to-one relation between form and function in language processing (cf. e.g., Newmeyer 1991: 11, Hsieh 1996), the existence of *gei3gei3* as a reduplicated form offers another motivation for the non-occurrence of *gei3gei3* as a ditransitive compound. From the interactionist point of view (e.g., Her 1994, 1994, Hsieh 1989, 1992a, 1992b) then, reduplication and V*gei3* compounding are two word-formation processes in conflict over verb *gei3*, where they intersect; the result, reduplication prevails, or in Kiparsky's (1978) term, reduplication bleeds V*gei3* compounding. Furthermore, given the pressure for economy in language production and thus a one-to-many relation between form and function (cf. e.g., Newmeyer 1991: 11, Hsieh 1996, Cheng 1991), the fact that *gei3gei3* as the compound form would function exactly identically as verb *gei3* also motivates its non-occurrence to avoid a many-to-one correspondence.

4. Huang (1993), along with Teng (1975) and Tang (1979), accounts for the non-occurrence of *gei3gei3* compound by haplology, a term first used in Chinese linguistics by Chao (1968) referring to a phonological rule that reduces two adjacent *le*'s in the sentence-final position to one single syllable *le*, e.g., **ta1 lai2 le le* 'he has come', where the first *le* is the perfective aspect marker and

the second the sentential modal particle indicating a change of state. As Huang (1993: 363) has correctly pointed out, haplology is attested for cases of affixed elements, e.g., suffixes, clitics, and particles. What is more important, nonetheless, is that in well-attested cases of haplology such as the one with *le*'s supported by Chao (1968), both adjacent elements, not just one, are affixational. 63a shows that possessive clitic *de* is required for proper nouns as possessors, and thus in 63b the *de de* sequence is reduced to a single *de*, even though the first *de*, a nominalizer clitic, has been lexicalized as part of the word *yao4fan4de* (one that begs for rice) 'beggar'. However, in 63c, the *ma1 ma1* sequence where the first *ma1* is part of a full-fledged lexical item followed by question particle *ma1* is perfectly good, and likewise *ba ba* in 63d and *guo4 guo4* in 63e are good.

63.a. Ta1 shi4 li3si4-*(de) mei4mei.
she be Lee POSS sister
She is Lee's sister.

a. Ta1 shi4 nei4 ge yao4fan4de-(*de) mei4mei.
she be that CLS beggar POSS sister
She is Lee's sister.

c. Ta1 shi4 ni3 ma1ma1 ma1?
she is you mama PTCL
Is she your mama?

d. Wo3men xian1 qu4 kan4 ba4ba ba!
we first go see papa PTCL
Let's go see papa first!

e. Zhe4 zhong3 sheng1huo2 ni3 guo4 guo4 ma1?
this kind life you live EXPR PTCL
Have you ever lived such a life?

Therefore, since the first *gei3* is a verb, haplology cannot be a good account for **gei3gei3*, regardless whether the second *gei3* is a suffix or a verb.

5. In all fairness, however, it should be noted that some morphologists do propose an intermediate category between suffix and the second compound member. For instance, as quoted in Haspelmath (1992: 71-72), the terms 'suffixoid' (Fleischer 1975: 70) and 'semi-suffix' (Marchand 1969: 356) were used to refer to such items like English *-like*, *-monger*, *-wise*, and *-worthy*. Also, Starosta (1985) uses the term 'pseudo-compounding' to refer to the derivational localizers in Chinese, acknowledging their less than clear-cut status. Within such a view, Huang and Mo's position, though not intended to be such a case by its authors, would seem less far-fetched than it first appears to be. There are two indications that V*gei3*, like the well-known resultative compound in Chinese, is not a typical compound: 1) its lexical semantics is predictable, and 2) it is productive. Although neither, nor both taken together, is adequate enough to disqualify V*gei3* as a compound, they do show that, compared to other

second V-V compound members, *gei3* is more likely a candidate for further grammaticization to become a so-called 'semi-suffix'.

6. Lin (1990), for example, proposes a V-P compounding process that involves the postverbal locative prepositions such as *zai4* 'at'. See Huang (1995) and Her and Huang (1995a) for arguments against this analysis.

64. Li3si4 zuo4 zai4 tai2-shang.
    Lee sit at stage-top
    Lee is sitting on the stage.

7. For example, Bresnan and Zaenen (1989: 291) suggest that location can be understood in an abstract sense in English *to*-dative sentences, where goal, like locative, also inverts.

65.a. To Louis was given the gift of optimism.
   b. To a French research team has been attributed the discovery of a new virus.

8. Huang (1993, 1990) actually supports the PP analysis of post-object *gei3*. However, he poses two kinds of goal in the thematic structure, one subcategorized for by the verb and the other, introduced only by an applicative morpholexical rule. While the applicative goal is linked to an oblique function, thus a PP, a subcategorized goal is linked to an indirect object. I agree with the PP analysis but will refute the dual sources of goal in section 3.

9. The principle of subcategorization is essential in various grammatical theories in one form or another (cf. Her 1990), for example Completeness and Coherence Conditions in LFG (e.g., Kaplan and Bresnan 1982) or the Projection Principle in the mainstream transformational framework (e.g., Huang 1982).

10. Likewise, in *he cried in his room*, the locational PP can only be an adjunct, not subcategorized for by the verb *cry*.

11. Blocking is a well-known phenomenon in morphology and phonology where exceptions to a general rule supersede the general rule, or the elsewhere condition. For example, irregular plural forms in English such as *children*, *feet*, and *deer* generally block regular forms, thus **childs*, **foots*, and **deers*. This blocking effect, or so-called elsewhere principle, does not seem to be as strict a constraint in syntax. However, see Zeevat (1995) for a discussion on the phenomenon of idiomatic blocking and how the elsewhere principle could provide a reasonable explanation. I would suggest that subcategorized PP's show also such a tendency. Subcategorization is a particular lexical requirement imposed by individual predicates while a PP can in general be an adjunct to any predicate; in other words, a PP is subcategorized-for only if a predicate requires it, elsewhere an adjunct.

12. Post-verbal *gei3* can also introduce a purposive clause, as in 66a-b.

66.a. Wo3 fei1 gei3 ni3 *(kan4).
      I fly for you see
   a' I'll fly for you to see.

   b. Li3si4 tan2 ji2ta1 gei3 ta1 *(ting1).
      Lee play guitar for she listen
   b' Lee plays the guitar for her to enjoy.

Here *gei3*, arguably, can be regarded as a complimentizer that introduces an embedded clause, similar to the *for-to* or *in order that* clauses in English. Huang and Mo (1992) use sentences like these and argue that since the object of *gei3* is also the functional subject of the embedded VP, which is obligatory in 66a-b, *gei3* must be a verb. If *gei3* is indeed a verb here, it is certainly not the

ditransitive *gei3* of thematic structure <ag go th>. It would be similar to pivot verbs like *rang4* 'allow' and *qing3* 'invite', whose thematic structure is <ag th prop>, as in 67a-b.

67.a. Ta1 bu4 rang4/qing3/gei3 ni3 kan4 dian4shi4.
he not allow/invite/let you watch TV
a' He won't allow/invite/let you (to) watch TV.

b. Li3si4 bu4 rang4/qing3/gei3 ta1 chi1.
Lee not allow/invite/let she eat
b' Lee won't allow/invite/let her (to) eat.

I do not intend to argue one way or the other whether this *gei3* is a pivot verb or a complementizer similar to English *for*. Refer to Paul (1988) for more data on this and a more detailed discussion. I do wish to reiterate two relevant points however, 1) regardless of *gei3*'s status here, the entire purposive clause is an adjunct, not a subcategorized constituent, and 2) that *gei3* is a verb elsewhere does not preclude the legitimacy of its post-object prepositional status. Sentences in 68 again confirm these points; 68a shows that *song4* 'give' subcategorizes for a goal and therefore in 68b the first [*gei3* NP] is a subcategorized PP and the later [*gei3* NP VP] phrase an adjunctive element.

68.a. Wo3 song4 le ta1 yi1xie1 shu1 gei3 ta1 er2zi kan4.
I give ASP she some book for she son read
I gave her some books for her son to read.

b. Wo3 song4 le yi1xie1 shu1 gei3 ta1 gei3 ta1 er2zi kan4.
I give ASP some book to she for she son read
I gave some books to her for her son to read.

13. This type of sentence is quite acceptable in some dialects of English (e.g., Jaeggli 1986: 596, Anderson 1988: 300, Dryer 1986: 833). Therefore, the important point to note here is that a satisfactory account should provide a sensible parameter and an explanation for this variation, instead of simply ruling it out or ruling it in. See 3.2 for details.

14. Recall that in 2.4 I mentioned the class of <ag pt th> verbs, whose syntactic structure is similar to that of ditransitive dative verbs (see 38b, repeated below) and whose patient is the passivized subject (see 39a, repeated below). The passive operations I propose correctly predict that patient is the passivized subject while theme is mapped to a secondary object.

38.b.

chi1 <	ag	pt	th >
IC's	-o	-r	+o
DC's			+r
GF Class.	S/O	S/O	OBJ_Θ
MP	SUBJ	OBJ	OBJ_Θ

Li3si4 chi1 le ta1 yi1 zhi1 ji1.
Lee eat ASP she one CLS chicken
(To her dislike,) Lee ate a chicken of hers.

39.a. chi1 < ag pt th >

IC's	-o	-r	+o
Passive			
DC's			+r
GF Class.		S/O	OBJ_Θ
MP		SUBJ	OBJ_Θ

Ta1 (bei4 Li3si4) chi1 le yi1 zhi1 ji1.
she by Lee eat ASP one CLS chicken
(To her dislike,) she had a chicken eaten by Lee.

The c-structures of <ag go th> ditransitive lexical form and that of <ag pt th> are thus different. The NP immediately following V encodes OBJ_Θ, or OBJ_{go} specifically, and also OBJ; in other words, the NP position following V is generalized to encode [+o] GF's. I propose the following ID/LP c-structure rules.

69.a. ID rule for VP:

VP -> V , NP* , PP*
$\uparrow OBJ/OBJ_\Theta = \downarrow$ $\uparrow OBL_\Theta = \downarrow$

b. LP rule for VP:
V > NP:OBJ_{go} > NP:OBJ > NP:OBJ_{th} > PP

This kind of ambiguity found in verbs like *jie4* 'borrow/loan' and *zu1* 'rent..to/from' is therefore the result of two different a-structures, see 70a-b for example.

70.a. jie4 < ag go th >

IC's	-o		-r
Dative		+o	
DC's	-r	+r	
GF Class.	SUBJ	OBJ_Θ	S/O
MP	SUBJ	OBJ_Θ	OBJ

Li3si4 jie4 le ta1 bu4shao3 qian2.
Lee loan ASP she much money
Lee loaned her a lot of money.

b. jie4 < ag pt th >

IC's	-o	-r	+o
DC's			+r
GF Class.	S/O	S/O	OBJ_Θ
MP	SUBJ	OBJ	OBJ_Θ

Li3si4 jie4 le ta1 bu4shao3 qian2
Lee borrow ASP she much money
Lee borrowed a lot of money off her.

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