A figure's final location must be identifiable: Localizer distribution in Chinese motion expressions

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A Figure's Final Location must be Identifiable: Localizer Distribution in Chinese Motion Expressions

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Introduction

A language sensitive to a thing-place distinction (e.g., cup vs. Paris) may use some thing-to-place conversion devices so that a thing can be conceptualized as a place. For instance, ***indlu*** 'house' in Zulu is a thing noun, so it must take a prefix and suffix so that it is understood as a place, as in *ngena* ***endlini*** 'enter the house' (Talor 1996). However, Mandarin Chinese behaves inconsistently in the use of the conversion device --- the addition of a localizer (e.g., *li* 'inside') to a thing noun--- in that the device is not required in every situation where a thing is understood as a place, cf. *dao chezi-*(li)* 'arrive car-inside' and *jin chezi-(li)* 'enter car-inside'. I argue that such inconsistent use is closely related to the other function of localizers: specifying the search domain of a ground that a figure is located with respect to at the end of a motion event. Specifically, Chinese adheres to a Localizer Condition according to which a localizer is not required if the information conveyed in the path verb and the (thing) ground is sufficiently specific to identify the figure's final location with respect to the (thing) ground. This condition is sensitive to both the figure-ground spatial relationships specified by path verbs and the physical and functional properties of grounds (Stosic 2007, Tutton 2009, among others). In addition, I show that the effects of the Localizer Condition are observed in other languages, despite differences in encoding spatial relations (Ameka 1999, Choi and Sarda 2007).

1 Converting Thing to Place

PLACE and THING are recognized as two ontological categories (Jackendoff

[1] I am very grateful to Beth Levin for her very helpful comments on the materials discussed in this paper. Abbreviations: AGR= Agreement marker; ASP= Aspect marker; CM= Class marker; CS= Conjunctive suffix; DET= Determiner; NEG= Negative marker; NOM= Nominative; PST= Present tense; TS= Terminal suffix; LOC= Locative/generic preposition; PL= Plural.

1983, cf. Choi and Sarda 2007, Stosic 2007). Spatial regions that can locate things are typically conceptualized as places (e.g., New York, China) (Jackendoff 1983). Things are physical objects, e.g., tree, table, that stand or move with respect to one another (Jackendoff 1983, cf. Choi and Sarda 2007). However, a thing concept can be converted into a place concept. For instance, a table by itself is a thing, but it can be conceptualized as a place if it is used as a support for other things (e.g., plates, books). Languages vary in the degree of their sensitivity to the distinction between places and things. In English, nouns are not morphologically marked to distinguish a place from a thing (Taylor 1996). For instance, a table is understood as a thing and a place, respectively in (1a) and (1b), but the conceptual difference is not morphologically marked.

(1) a. I bought **a table**. (table as a thing)
b. The book is on **the table**. (table as a place)

In contrast, nouns denoting things in Zulu must be locativised so as to express a place meaning, as in (2) (Taylor 1996).

(2) a. ngena **endlini**
enter house-LOC
'enter the house'

b. *ngena **indlu**
enter house

(Taylor 1996: 295)

In Mandarin Chinese as well, a thing noun, or common noun, usually cannot be used as a place noun. As (3) illustrates, *fangzi* 'house' and *zhuozi* 'table' cannot be taken directly as the complements to the locative preposition *zai* 'at'; rather, a localizer such as *–li* 'inside' in (3a) and *–shang* 'on top of' in (3b) must be used to convert the thing nouns into place nouns. [2]

(3) a. xiaohai zai **fangzi-*(li)** wanr
kid at house-inside play
'The kid is playing in the house.'
b. **xiaomao zai zhuozi-*(shang)** shuijiao
kitty at table-on.top.of sleep
'The kitty is sleeping on the table.'

Chinese has monosyllabic and disyllabic localizers. Besides *-li* and *-shang*, other

[2] Chinese localizers are grammaticalized from nouns (Chappell and Peyraube 2008, Huang, Li, and Li 2009, among others). However, previous studies have not yet reached a consensus as to whether these morphemes belong to a lexical category other than noun or are instead a subclass of noun (see Li 2009, among others). Therefore, these forms are referred to in different terms, e.g., as "NP enclitics" by Sun (2006: 85, 2008), "locative particles" by Li and Thompson (1981: 391), "postpositions" by Liu (2008: 39). For the purpose of this paper, I use the relatively neutral term "localizer".

monosyllabic localizers include *wai* 'outside', *xia* 'down', *qian* 'front', *hou* 'back', *li/nei/zhong* 'inside', and *pang* 'side' (Li and Thompson 1981, Sun 2006). Disyllabic localizers are formed via the addition of a suffix such as *bianr* 'side', *mianr* 'face', or *tou* 'head' to a monosyllabic localizer, e.g., *-libianr* 'inside', *shang-mianr* 'on top of' (ibid.).

However, localizers are not used consistently in Chinese to convert a thing noun into a place word. For instance, localizers are required by *fangzi* and *zhuozi* when they are taken as complements by the path verb *dao* 'arrive' in (4).

(4) a. xiaohai dao le **fangzi-*(li)**
kid arrive ASP house-inside
'The kid went into the house.'
b. xiaomao dao le **zhuozi-*(shang)**
kitty arrive ASP table-on.top.of
'The kitty went onto the table.'

But *fangzi* and *zhuozi* can be directly taken as complements by the path verb *jin* 'enter' and *shang* 'ascend', respectively, as in (5a) and (5b).

(5) a. xiaohai jin le **fangzi**
kid enter ASP house
'The kid entered the house.'
b. xiaomao shang le **zhuozi**
kitty ascend ASP table
'The kitty went onto the table.'

By drawing evidence from expressions of directed motion events in Modern Mandarin Chinese, this paper shows that a language sensitive to a place-thing distinction may behave inconsistently in their use of thing-to-place conversion devices. The term "directed motion event" refers to an event in which a moving object moves spontaneously (without an external cause) in a certain direction with respect to a reference object and ends up in a new location as a consequence of that event. The moving object and the reference object are called "figure" and "ground" (Talmy 2000: 25), respectively. This paper proposes that if a figure's location with respect to the thing is identifiable based on the information of a motion expression, then the thing is understood as a place without a conversion device. In Chinese, a localizer does not need to be explicitly used, if the figure's location at the end of its motion can be identified via the direction lexicalized in a motion verb and the physical and functional features of the place conceptually shifted from the thing.

2 Previous Studies on the Distribution of Chinese Localizers

With the exception of Lamarre (2007) and Cai (2006), previous studies have

seldom discussed the environments where a thing NP needs to co-occur with a localizer in order to function as the complement to a path verb.

Cai (2006) proposes that a thing NP cannot co-occur with a localizer in the sequence "manner of motion verb + path verb + ground NP + deictic complement", as in (6).

(6) ta zou chu **jiaoshi-(*li)** qu
he walk exit classroom-(inside) go
'He went out of the classroom.' (Cai 2006: 68)

However, many counter-examples can be found. For instance, (7) shows a motion expression with the same sequence as that in (6), but a localizer is required for the ground NP *zhuozi* 'table'.

(7) mayi pa dao **zhuozi-*(xia)** qu
ant crawl arrive table-(under) go
'The ant crawled under the table.'

Lamarre (2007: 5) also claims that the path verbs *hui* 'return', *dao* 'arrive', *lai* 'come' and *qu* 'go' "require a localizer on the locative NP if it is not *per se* a place word." She does not provide further evidence for this claim, but counterexamples can be found, as in (5), where the path verb *jin* 'enter' takes a common noun directly as its complement.

3 The Localizer Condition on Localizer Distribution in Thing Ground NPs

Path verbs, or "verb of inherently directed motion" (Levin 1993: 263), lexicalize both motion and direction (Talmy 2000). Chinese path verbs that can take ground NPs directly as their complements in Chinese include *jin* 'enter', *chu* 'exit', *shang* 'ascend', *xia* 'descend', *hui* 'return', *dao* 'arrive', and the deictic path verbs *lai* 'come' and *qu* 'go' (cf. Lamarre 2008, Cai 2006, Guo and Chen 2009, and others). When these path verbs follow a manner of motion verb or another motion verb, they are usually referred to as "directional complements" in some previous studies such as Liu (1998) cf. Tai (2003). However, these directional complements express the same direction and take the same ground NPs as the corresponding path verbs; thus, for convenience, the term "path verbs" is used regardless of whether they are path verbs or directional complements.

I propose that the use of localizers with the ground NPs taken as complements by Chinese path verbs is closely related to the other important function of the localizers, i.e. to specify the "search domain", the "space anchored to the ground" where a physical object is located (Ameka 1999: 9, cf. Nikitina 2008). In other words, the localizers specify where with respect to the ground, e.g., on top of,

above, inside, outside, under, or on bottom of, the figure can be found. And the use of localizers conforms to a Localizer Condition:

(8) **Localizer Condition**: A localizer needs to occur and convert the thing noun into a place word if the information conveyed in the verb and the physical and functional properties of the ground is not sufficiently specific to identify the figure's location with respect to the ground at the end of the motion event.

The condition is sensitive to (a) the figure-ground spatial relationships specified by the path verb, and (b) the physical and functional properties of the grounds. The remainder of this section discusses them in more detail.

3.1 Degree of Specification of Direction in Path Verbs

Not only does each path verb lexicalize a distinct direction, but path verbs may also differ from each other as to the degree of specification they provide for the direction (Rappaport Hovav and Levin 2010). Furthermore, the more specific the direction lexicalized by a path verb is, the more restricted it is in its selection of ground NP complements because it requires its complements to encode a location compatible with this particular direction. For instance, the verb *jin* 'enter' denotes motion with an 'into' direction. That is, a figure moving in this way crosses a boundary and moves into the enclosed region across the boundary. Thus, the ground complements to this direction must be enclosed regions, whereas non-enclosed regions are not allowed by *jin* 'enter', as in (9).

(9) a. *jin **fangjian-wai**
enter room-outside
'enter the outside of the room' (intended meaning)
b. *jin **fangjian-shang**
enter room-on.top.of
#'enter onto the room' (intended meaning)

With a path verb that lexicalizes a more specific direction and a ground compatible with the direction of motion, a motion expression contains sufficient information to allow the identification of the figure's final location. Consider *jin* 'enter' once more. By carrying out the motion of entering, the figure must be located inside an enclosed region. According to the Localizer Condition, the ground NP *fangzi* 'house' does not need co-occur with a localizer, which is why (5a), repeated here as (10a), is felicitous. The use of the localizer *-li* in (10b) does not violate the Localizer Condition, but it is dispreferred because of information redundancy.

(10) a. xiaohai jin le **fangzi**
Kid enter ASP house
'The kid entered the house.'
b. xiaohai jin le **fangzi-li**
kid enter le hosue-inside
'The kid entered the house.'

Figure 1 illustrates the use of localizers with thing NPs that are taken by the path verbs *jin* 'enter' found in the PKU Corpus.[3] All entities denoted by the five NPs denote enclosed entities with clear-cut boundaries that separate their interior and exterior spaces; and localizers expressing 'inside' are more often not used with these NPs.

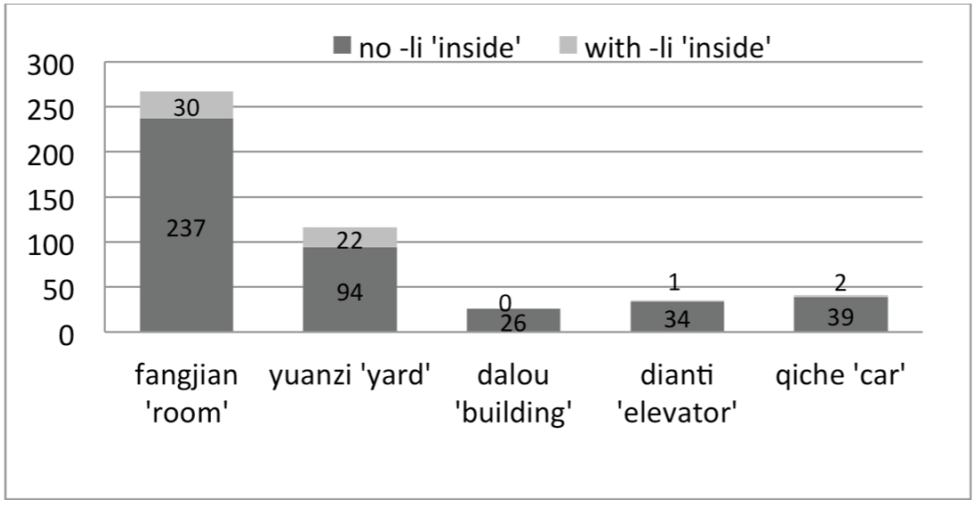

Figure 1: The use of *-li* 'inside' with NPs taken as complements by *jin* 'enter'

In contrast, a path verb lexicalizing a less specific direction is also less restricted in its selection of ground NPs. For instance, the path verb *dao* 'arrive' is not specific because a figure can arrive at a location from different directions. In particular, depending on the figure's source location, the figure can arrive from a location outside, inside, below, or above the location to be arrived at. Therefore, all the ground NPs taken by path verbs lexicalizing more specific directions, e.g., the path verbs *jin* 'enter', *chu* 'exit', *shang* 'ascend', and *xia* 'descend', are also available as complements of *dao* 'arrive'.

However, a motion expression with a verb lexicalizing a less specific direction cannot precisely identify the figure's location with respect to the ground. Consider

[3] The PKU Corpus refers to corpus of Modern Chinese constructed by the Center for Chinese Linguistics at Beijing University. The corpus is available online at http://ccl.pku.edu.cn/. Currently (4/2011), it has 307,317,060 characters as updated on 7/20/2009.

the motion event that involves *dao* 'arrive' and *fangzi* 'house'. Since a house has an interior and exterior, and since a figure can start moving from either the interior or exterior of the house, the expression *dao fangzi* arrive house fails to identify whether the figure arrives inside or outside of the house if contextual clue is unavailable. Therefore, a localizer is necessary, as in (11), cf. *jin* 'enter' in (10).

(11) a. xiaohai dao le **fangzi-li**
kid arrive ASP house-inside
'The kid went into the house.'
b. xiaohai dao le **fangzi-wai**
kid arrive ASP house-outside
'The kid went out of the house.'

In addition, because *dao* is not specific as to the direction of motion, a figure carrying out an event of arrival can potentially reach any accessible location from any direction. Consider the common noun *qiche* 'car' as another example. *Qiche* cannot be directly taken as a complement by *dao* 'arrive' according to the Localizer Condition. The PKU Corpus shows that among all 45 instances of *dao qiche* arrive car, there are only two instances (4%) in which a localizer is not used. Figure 2 shows the frequency of each localizer co-occurring with *qiche* as a complement to *dao*.[4]

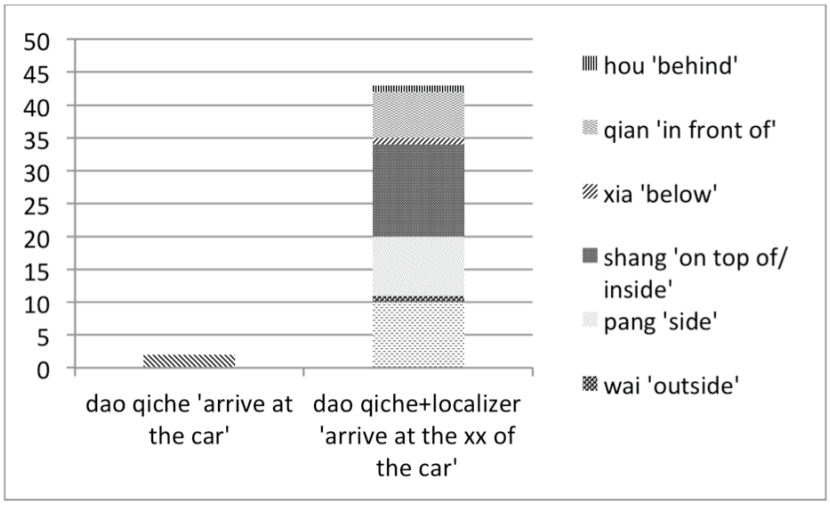

Figure 2: Frequency counts of *qiche* 'car' as a complement to *dao* 'arrive'

[4] For convenience, this paper uses one monosyllabic localizer to represent all the different forms of localizers expressing the same search domain found in the corpus, e.g., *-shang* 'on' covers *-shang* 'on, up', *-shangmianr* (lit.) 'on-face', *-shangtour* (lit.) 'on-head' and *-shangbianr* (lit.) 'on-side' and *-li* 'inside' covers *-li* 'inside', *-limian* (lit.) 'in-face', *-litou* (lit.) 'in-head', *-libian* (lit.) 'in-side', *-zhong* 'inside', and *-nei* 'inside'.

Other path verbs also differ in the degree of specification of direction. For instance, like *jin* 'enter' and *chu* 'exit', the directions lexicalized in *shang* and *xia* are so specific that a figure cannot move in any other direction. As illustrated in (12), *shang* 'ascend' only lexicalizes motion up to a location, and is unable to describe motion going down from a location or into a region, although the location or region may have accessible space for going down or going into.

(12) a. shang **zhuozi**
ascend table
'go up to the table'
b. *shang **zhuozi-xia**
ascend table-under
'go up to the [space] under of the table' (intended meaning)

The directions of motion lexicalized in the deictic path verbs *lai* 'come' and *qu* 'go' vary with respect to the deictic center (usually the speaker). When the speaker's location with respect to the ground is not inferable, a localizer is required. For instance, as illustrated in (13a), the motion expression does not indicate whether the speaker is inside or outside the room, and thus it is not inferable whether the figure moves into or out of the room. Therefore, localizers *-li* 'inside' and *-wai* 'outside' are necessary to express motion into or out of the room, respectively, as in (13b).

(13) a. *lai/qu **fangjian**
come/go room
b. lai/qu **fangjian-li/wai**
come/go room-inside/outside
'come/go into/out of the room'

In contrast, when the deictic center's location is known, a localizer is optional. For instance, as shown in (14), the figure (and the speaker) was originally located outside of Pantani's room; and she assumed Pantani to be in the room and then went inside the room. In this sentence, the spatial relationships among the figure, Pantani, and the room are explicit, thus making *-li* 'inside' unnecessary.

(14) youyu dangtian henchang shijian meiyou kan-dao Pantani,
because that.day very.long time NEG see-arrive Pantani
suoyi qu ta **fangjian** chakan
so go his room check
'[I] went to his room for a check because [I] did not see Pantani for a very long time on that day.' (PKU Corpus)

The path verb *hui* 'return' lexicalizes a direction more specifically than do *dao* 'arrive', *lai* 'come' and *qu* 'go', but less so than *jin* 'enter', *chu* 'exit', *shang* 'ascend', and *xia* 'descend'. For instance, like *jin* and *chu*, *hui* is able to directly

take a ground NP denoting a region-like entity, e.g., *fangjian* 'room', from which the figure's location is understood to be inside of the region. However, unlike *jin*, *chu*, *shang*, and *xia*, which only describe motion with a fixed direction, *hui* may refer to motion in any possible direction, just like *dao* 'arrive'. As illustrated in (15), *hui* is able to express both motion into a region or onto a surface when the NPs co-occur with appropriate localizers, whereas other path verbs such as *jin* 'enter' cannot express motion onto a surface of an entity, and *shang* 'ascend' cannot express motion into a region.

(15) a. hui **zhuozi-shang**
return table-on.top.of
'return to the top of the table'
b. hui **zhuozi-li**
return table-inside
'return to the inside (e.g., a drawer) of the table'

As shown above, although all the path verbs lexicalize certain paths, they differ from each other in the specification of the paths, which in turn determines whether their common noun ground NPs need to be converted into place words by localizers. As indicated by the Localizer Condition, a path verb lexicalizing a more specific direction tends to take a compatible thing NP directly as its ground NP. In contrast, a path verb lexicalizing a less specific direction requires its ground NP to co-occur with a localizer so as to help identify the figure's location with respect to the ground.

3.2 The Functional Properties of the Ground

Many grounds possess more than one spatial domain (e.g., the inside and top of a box), and these spatial domains may be accessed by a figure in different directions. For instance, a figure can move along the horizontal axis into a box or along the vertical axis onto the top of the box. Thus, a box can potentially co-occur with the localizers *-li* 'inside' and *-shang* 'on top of'. Nonetheless, I propose that a ground is more often accessed from a salient accessible axis, that is, the axis corresponding to the direction of motion in which a figure can reach the ground's "use space" (Svorou 1994: 15) and take advantage of its canonical function there. The use space of the ground refers to the spatial domain with that ground's most salient functional property, i.e. the use and purpose of the ground (Svorou 1994, Chu and Wang 2008). If the figure moves in the direction of that use space, the localizer specifying the corresponding spatial domain is unnecessary because it is understood that after the motion, the figure will be located in that use space of the ground. I will illustrate the effects using *maopajia* (lit.) 'cat climb shelf' and *maolong* (lit.) 'cat cage' as examples.

The most salient function of *maopajia* (lit.) 'cat climb shelf', a tree-like entity with ledges that a cat can jump onto and rest, is to support cats rather than contain them, even though a *maopajia* may also have a cubby hole that the cat can enter and stay in. Thus, the path verbs *shang* 'ascend' and *xia* 'descend', but not *jin* 'enter' and *chu* 'exit', can take *maopajia* directly as their complement, as in (16a). On the other hand, the most salient function of *maolong* (lit.) 'cat cage', a house-like container for a cat to rest in, is to provide an enclosed area for a cat, though it may include interior ledges. Thus, *maolong* can co-occur with the path verbs *jin* 'enter' and *chu* 'exit', but not with *shang* 'ascend' and *xia* 'descend', as in (16b).

(16) a. xiaomao tiao shang/xia/*jin/*exit le **maopajia**
small.cat jump ascend/descend/enter/exit ASP cat.climbing.shelf
'The kitty jumped up to/down from the cat tree.'
b. xiaomao tiao *shang/*xia/jin/chu le **maolong**
small.cat jump ascend/descend/enter/exit ASP cat.cage
'The kitty jumped into/out of the cat cage.'

However, although a ground usually has only one spatial domain carrying the most salient function of this ground, this domain may be conceptualized in different ways, hence accessible from different directions. For instance, entities such as *feiji* 'airplane', *huozhe* 'train', and *qiche* 'car' can be treated both as bounded regions and supporting surfaces at the same time: on the one hand, these entities can hold human beings in their interior regions; on the other hand, the floors inside their interior spaces are the most salient spatial domains because the floors are the only domains that humans can stay on. Therefore, the common nouns encoding these entities may co-occur with both *jin* 'enter' and *shang* 'ascend'. In addition, no matter whether these entities co-occur with *jin* or *shang*, the humans' location is always inside and on the surface floor of these entities. Thus, localizers such as *-li* 'inside' and *-shang* 'up, on top of' are unnecessary, as shown in (17). This omission of localizers further supports the Localizer Condition: a localizer is not used if the figure's final location can be identified with respect to the ground.

(17) a. jin feiji b. shang feiji
enter plane ascend plane
'board the plane' 'board the plane'

3.3 Summary

This section shows that the use of localizers with thing ground NPs obeys the Localizer Condition. Chinese has examples where a localizer is used although it is unnecessary according to the condition, or a localizer is not used even though it is

expected by the condition. Detailed explanation is not provided in this paper, but I argue that these examples should not be taken as a challenge to the Localizer Condition, because in those examples, the use of localizers is also affected by the number of syllables in the ground NPs and pragmatic motivations (cf. Sun 2008).

4 A Cross-linguistic Perspective on the Localizer Condition

Languages may use different ways to express the search domain. For instance, Likpe (Central Togo) uses postpositions (Ameka 1999), as in (18), whereas Korean uses "relational noun of localization" (Choi and Sarda 2007), as in (19).

(18) bə-bəə bə-nyə̃ bəə be-tidi be-tsywə́
3PL-come 3PL-see that CMPL-person CMPL-some
sí lə́ **kɔ-tíni ká-lɔ́**
sit LOC CM-mountain under
'When they came they saw that there were some people living/staying at the bottom of the mountain.' (Ameka 1999: 22)

(19) mimi-ga **cap^{h}an-ɥi-e** oll-a-ga-s'-ə
Mimi-NOM keyboard-top-LOC move.up-CS-go-PAST-TS
'Mimi (a cat) climbed on the keyboard.' (Choi and Sarda 2007: 137)

However, the Localizer Condition appears to be operative in these languages as well.

4.1 The Distribution of Postpositions in Likpe

Ameka (1999) observes that Likpe postpositions are not used in all spatial expressions. He proposes two conditions for their omission. One is that postpositions become unnecessary whenever the verb and the ground can be "interpreted stereotypically" (Ameka 1999, 26). By stereotypical interpretation, Ameka provides an example showing that when the figure is in a ground with a containing region (e.g., a building), the postposition expressing 'inside' is not expressed because the figure can be typically understood to be located inside of the ground, as in (20).

(20) o-kpé **dí-yó**
3SG-V CM-building
'He is in the building.' (Ameka 1999: 26)

The second condition is relevant to the direction specified as part of a verb's lexical meaning. Postpositions are unnecessary if the search domain is indicated by the meaning of the verb (and context). For instance, Ameka points out that the

verb *tə́kə́* 'make contact with supporting surface' does not require the ground to take the postposition *ə-suə* 'surface' in order to express an 'on horizontal surface' relation because the verb already entails the meaning of surface contact, as in (21).

(21) ku-kwə ko-mə́ tə́kə́ li **shelf**
CM-book AGR-DET V LOC shelf
'The book is on the shelf.' (Ameka 1999: 26)

These two conditions in Likpe are comparable to the condition of using localizers in Chinese. That is, a postposition or localizer is not needed to further specify the figure's location when it can be inferred from the verb and the nature of the ground.

4.2 The Distribution of "Relational Noun of Localization" in Korean

Korean also has a similar condition. According to Choi and Sarda (2007), the path verbs *dɨlə-ga-da* 'move in' and *na-ga-da* 'move out' select a ground denoting a three-dimensional object with an interior (e.g., house), as in (22a). If the ground has no interior (e.g., table), a localizer (or "relational noun of localization" in Choi and Sarda) must follow the noun denoting the ground, as in (22b).

(22) a. Insu **cib-e** dɨl-ə-ga-n-da
Insoo house-LOC move.in-CS-go-PST-TS
'Insoo is entering the house.'
b. insu-ga **c^{h}ɛgsaŋ-mit-e** dɨl-ə-ga-n-da
Insoo-NOM table-underneath-LOC move.in-CS-go-PST-TS
'Insoo is going under the table.' (Choi and Sarda 2007: 136)

Therefore, Both Korean and Likpe operate like Chinese in their optional use of localizers (or relational nouns of localization, postpositions); that is, the use of localizers is determined by whether it is necessary to help identify the figure's final location. In addition, as in Chinese, the localizers expressing 'inside' and 'on top of/above' are the ones that are most often omitted in Korean and Likpe.

5 Conclusion

In this paper, I have shown that although Chinese show some sensitivity to the thing-place distinction, the localizer as a thing-to-place conversion is not required in all motion expressions. Therefore, Chinese on one hand is unlike English which is not sensitive to the distinction at all, and on the other hand is unlike Zulu that always require some devices for converting a thing noun into a place noun. In addition, I provide evidence showing that the use of Chinese localizers is influenced by the other function of the localizers, i.e. specifying the search domain in

relation to a ground where the figure is located. Conforming to the Localizer Condition, a localizer is required to co-occur with a thing ground NP if the figure's final location cannot be identified via the information conveyed in the path verb and the ground, so that it can help specify the spatial relationship between the figure and the ground. In addition to Chinese, I have shown that the Localizer Condition can also be found in other languages, including those which use adpositions rather than verbs to encode spatial relationships. The cross-linguistic similarities indicate a general operation in the encoding of spatial relationships and the search domain.

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