

Auxiliary selection in Chinese*

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This paper argues that the distribution of the two Chinese aspectual auxiliaries *-le* and *-zhe* in the locative inversion construction is determined by the semantics of the event, in particular the interaction of lexical aspect (telicity and stativity) and agentivity. The *-le/-zhe* alternation shows a gradient effect similar to the selection of perfective auxiliaries in Romance and Germanic (Sorace 2000), since telic verbs select *-le*, dynamic atelic verbs select *-zhe*, and verbs that fall in between may show variable behavior depending on other factors. The fact that auxiliary selection with ‘detransitivized’ verbs (analogous to passives) is sensitive to the same semantic parameters is offered as evidence against a purely syntactic analysis of the *-le/-zhe* alternation.

1. Introduction

Auxiliary selection is perhaps one of the most studied phenomena associated with split intransitivity, partly because it has been used to support two opposing approaches to split intransitivity. On the one hand, auxiliary selection has been considered a diagnostic of unaccusativity in Germanic and Romance languages (Burzio 1986; Hoekstra 1984, 1999; Legendre 1989, among others), which together with other phenomena, e.g. impersonal passivization (Perlmutter 1978), and *ne-cliticization* (Burzio 1986), can be explained by the Unaccusativity Hypothesis (Perlmutter 1978). According to the hypothesis, intransitive verbs are classified into two groups: unaccusative verbs, which are assigned an underlying object, and unergative verbs, which are assigned an underlying subject. On this hypothesis, verbs that select ‘be’ are unaccusative, while verbs that select ‘have’ are unergative. This is a syntactic approach to split intransitivity. On the other hand, it has

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also been proposed that the choice of ‘be’ vs. ‘have’ is determined by semantic factors, including aspectual properties of the predicate and thematic relations, e.g. telicity and agentivity (Sorace 2000), lexical aspect for Italian (Van Valin 1990), telicity for Dutch (Zaenen 1993), inferable position or state for Dutch (Lieber & Baayen 1997), and patient-like (affected) subject for Old Spanish (Aranovich 2004). In a semantic approach to split intransitivity, verbs that select ‘be’ are not necessarily assigned an underlying object; rather, these verbs share properties that are characterized in semantic terms. In addition, the choice of auxiliary is not always clear-cut, but is gradable (Sorace 2000; Aranovich 2004). To date, the debate between the two approaches has been based on European languages.

In this paper I would like contribute to the debate by examining auxiliary selection in a typologically different language – Chinese. I will show that the Chinese data cannot be accommodated in a syntactic analysis; rather, the data requires a semantic analysis. This in turn supports a semantic approach to split intransitivity. Auxiliary selection in Chinese has not received much attention in the literature. To my knowledge, Yu (1995), Hu (1995) and Yang and Pan (2001) are the only studies that have examined this phenomenon. While Yu (1995) (reviewed in 5.2) takes a syntactic approach, linking it to the Unaccusativity Hypothesis, Hu (1995) and Yang and Pan (2001) (reviewed in 4.1) consider semantic factors that affect the choice. All three studies cover a limited variety of verb types. A much wider range of verb types will be examined in this study. Since the only environment in Chinese where the issue of auxiliary selection arises is the locative inversion construction, I will first discuss aspects of the construction that are relevant for my study; in particular, I will examine which types of verbs occur in the construction with respect to their argument structure.

2. Locative inversion

Locative inversion in Chinese has the structure *Loc + V + Asp + NP*. The locative phrase that normally occurs after the verb with a preposition, as in (1b), is in the initial position without the preposition, as in (1a):

- (1) a. Qianmian zhan-le henduo ren
 in-front stand-LE many people
 ‘In front are standing many people.’
 b. Henduo ren zhan zai qianmian
 many people stand at in-front
 ‘Many people are standing in front.’

The construction is also referred to in Chinese studies as existential sentences (Huang 1987), presentative sentences (Hu 1995), and existential structure (Yang

& Pan 2001). Two characteristics about Chinese locative inversion stand out. First, unlike English, where only intransitive verbs enter the construction, in Chinese the verb can be either transitive or intransitive. (1a) contains an intransitive verb, and (2), a transitive verb:

- (2) Yuanzili zhong-zhe yixie guoshu
 yard-in plant-ZHE some fruit-tree
 'In the yard are planted some fruit trees.'

Secondly, an aspect marker is required for most of the verbs that occur in locative inversion. In (1) *zhan* 'stand' is marked by the perfective marker *-le*, while *zhong* 'plant' in (2) is marked by the imperfect marker *-zhe*. These sentences are ungrammatical without an aspect marker, as in (3):

- (3) a. *Qianmian zhan henduo ren
 in-front stand many people
 'In front are standing many people'
 b. *Yuanzili zhong yixie guoshu
 yard-in plant some fruit-tree
 'In the yard are planted some fruit trees.'

Aspect marking is optional with compound verbs of the form V+ directional, as in (4) (Hu 1995):

- (4) Waimian chui-lai (-le) yizhen feng
 outside blow-come- LE one-gust wind
 'From outside blows a gust of wind.'

Among the non-compound verbs, only two verbs don't require aspect marking: the copula *shi* 'be' and the existential verb *you* 'exist'. *Shi* 'be' cannot be marked; on the other hand, *you* 'exist' can be marked by either *-le* or *-zhe*, with different meanings, as given in (5):

- (5) a. Tade lianshang zhongyu you-le/*-zhe xiaorong
 his face-on finally have-LE/-ZHE smile
 'On his face finally appeared a smile.'
 b. Ta duzili you *-le/(-zhe) shuo bu wan de gushi
 he stomach have -LE/-ZHE tell not finish DE story
 'In his stomach are endless stories.'

In (5a), with *-le*, *you* is a verb of appearance; in (5b), with *-zhe*, *you* is a verb of existence. Thus the choice of *-le* or *-zhe* is not free in (5a–b). Another thing we can observe is that *-zhe* in (5b) is optional. The meaning of the sentence remains the same whether *-zhe* is present or not. For verbs other than *shi* and *you*, however, an aspect marker is required, and the question of which aspect marker is chosen for a given verb naturally arises. This question will be the focus of my study.

There is some confusion in the literature, however, on whether a given sentence of the form Loc + V + Asp + NP is indeed a case of locative inversion. This is an important issue because it concerns what constitutes the data for our study. Below I will examine the transitive and intransitive verbs in the structure. I will show that while intransitive verbs in this construction are free to take either an argument or an adjunct locative phrase, transitive verbs must take an argument locative phrase.

2.1 Intransitive verbs

As noted by Huang (1987) and Yang and Pan (2001), for certain verbs the position for the locative NP need not be filled, as seen in (6)–(7):

- (6) a. Lai-le yizhi gou
 come-LE one-CL dog
 ‘There came a dog.’
 b. Yuanzili lai-le yizhi gou
 yard-in come-LE one-CL dog
 ‘In the yard came a dog.’
- (7) a. Si-le yige ren
 die-LE one-CL person
 ‘There died a person.’
 b. Cunzili si-le yige ren
 village-in die-LE one-CL person
 ‘In the village died a person.’

Verbs that take an optional locative NP are directional verbs or (dis)appearing verbs, and they are intransitive. Other intransitive verbs, however, require the locative NP position to be filled, as in (8):

- (8) a. *Zuo-zhe yige ren
 sit-ZHE one-CL person
 ‘There is sitting a person.’
 b. Menkou zuo-zhe yige ren
 doorway sit-ZHE one-CL person
 ‘At the doorway is sitting a person.’

I will take the locative NP that is required, e.g. *menkou* in (8b), as an argument, subcategorized by the verb, while the locative NP that is not required, e.g. *yuanzili* in (6b) and *cunzili* (7b), as an adjunct, which is not subcategorized by the verb. I assume that the contrast between (6)–(7) and (8) is due to a constraint that an argument locative NP must be overtly expressed in the syntax, while an adjunct

locative NP need not be. For intransitive NPs, then, the locative NP can be either an argument or an adjunct.

2.2 Transitive verbs

When the verb is transitive, however, the locative NP position must be lexically filled, as illustrated in (9)–(10):

- (9) a. *Fang-zhe yiben shu
 put-ZHE one-CL book
 ‘*There was put a book.’
 b. Zhuoshang fang-zhe yiben shu
 table-on put-ZHE one-CL book
 ‘On the table was put a book.’
- (10) a. *Xie-le yige zi
 write-LE one-CL character
 ‘*There was written a character.’
 b. Heibanshang xie-le yige zi
 blackboard-on write-LE one-CL character
 ‘On the blackboard was written a character.’

Therefore, I assume the locative NP in sentences with transitive verbs is always an argument. This assumption not only rules out (9a), but also excludes (11), as the locative NP *chufangli* ‘in the kitchen’ is not subcategorized by the verb *ca* ‘wipe’:

- (11) *Chufangli ca-zhe chuangzi
 kitchen-in wipe-ZHE window
 ‘In the kitchen was wiping the window.’

The argument requirement on the locative NP also affects how a sentence is to be interpreted. For example, (12) only has the interpretation that three characters are written on the car; it cannot be interpreted as someone wrote three characters while in the car:

- (12) Cheshang xie-le sange zi
 car-on write-LE three-CL character
 ‘On the car were written three characters’

If *cheshang* ‘on the car’ is an argument, then the interpretation of (12) follows, since as an argument, the locative NP predicates on the theme object, not the agent. Sentences such as (12), therefore, support the argument requirement of the locative NP in transitive sentences.

Pan (1996:426) notes that the locative phrase in locative inversion sentences must predicate on the theme phrase rather than indicating the location of the event. He gives (13), (his (50)), as an example:

- (13) a. John zai zhuozishang xie-le yifeng xin
 John at table-on write-LE one-CL letter
 'John wrote a letter at the table.'
 'John wrote a letter on the table.'
- b. Zhuozishang xie-zhe yifeng xin
 table-on write-ZHE one-CL letter
 'On the table is written a letter.'

(13a) is ambiguous, with the table indicating either where John was or where the letter was, but (13b) only has the reading in which the table is where the letter was. Although Pan does not say so, his constraint in effect requires that the locative phrase be an argument rather than an adjunct. This constraint, when applied to transitive verbs, as in Pan's study, yields the desirable result, but it is too strong when applied to intransitive verbs. It would eliminate (6b) and (7b), which, as suggested earlier, include an adjunct locative NP. Nonetheless, the constraint can be used as a criterion to evaluate sentences that contain transitive verbs and have the surface sequence of Loc + V + Asp + NP to determine if they are indeed cases of locative inversion. Consider (14):

- (14) Wuli tan-zhe gangqin
 room-in play-ZHE piano
 'In the room is playing the piano.'

(14), if acceptable, is not a case of locative inversion, because *wuli* 'in the room' is not an argument of the verb *tan* 'play', as it is not subcategorized by the verb. Consider also (15) and (16):

- (15) Taishang chang-zhe daxi
 platform-on sing-ZHE opera
 'On the platform (people are) singing the opera.'
- (16) Fangjianli kai-zhe hui
 room-in open-ZHE meeting
 'In the room is having a meeting.'

In both sentences the locative phrase acts as an adjunct, not as an argument, as the verbs also do not subcategorize for a locative argument. Therefore, they are not cases of locative inversion either. (15) and (16) are included in Yang and Pan (2001) as examples of the existential construction, which according to them, has the syntactic structure of NP loc + V + NP. I will not attempt to compare locative inversion as discussed here with the existential construction discussed by Yang and

Pan. I only want to point out that while (15) and (16) may be existential sentences; they are not instances of locative inversion as discussed here.

Now with transitive verbs, an issue of argument expression arises. On the basis of the discussion above, transitive verbs that occur in locative inversion are three-place verbs, and yet the construction only provides two argument positions, the question naturally arises: what happens to the third argument? From the examples above, it is clear that the external argument is never realized. It seems plausible that in locative inversion an operation has applied such that the transitive verbs are detransitivized. Pan (1996) postulates an agent-deletion rule whereby the agent is deleted from the argument structure of a two-place transitive verb. However, the rule as postulated is subject to a number of conditions. Rather than applying in general to three-place transitive verbs, the rule is triggered by the presence of the imperfective marker *-zhe* only. In Yang and Pan (2001), this analysis is abandoned because the rule has ‘many exceptions’ (p. 194).

I suggest that rather than deleting the agent from the argument structure, the detransitivization operation suppresses the external argument from a three-place transitive verb. Any transitive verb that also takes a locative argument can have its external argument suppressed so that it is not represented in syntax. The derived argument structure, with the external argument suppressed, then feeds naturally into locative inversion, where the locative argument is realized as the locative phrase, while the other internal argument – the Theme argument – is realized as the single non-locative argument of the verb. This operation is similar to the operation proposed by Grimshaw (1990) that derives the passive form of a verb from the active form, where the external argument is also suppressed.

Although the external argument of a detransitivized verb cannot be expressed in syntax, it is present in the argument structure. Grimshaw shows that the external argument of a passive verb licenses the *by*-phrase, and it is also the controller of purpose clauses. Similarly, the external argument of a detransitivized verb in locative inversion also controls the following purpose clauses, as shown in (17):

- (17) Qianyuan zhong-le xuduo shu, xiatian hao chengliang
 front-yard plant-LE many tree summer in-order-to get-cool
 ‘In the front yard (are) planted many trees, so that (people) can get cool in the summer.’

In this way the relation between detransitivized verbs and transitive verbs in Chinese resembles that between the passive form of a verb and the active form of a verb in English.

In summary, in this section I have considered what types of verbs enter locative inversion with respect to a verb’s argument structure. While intransitive verbs take either an argument or an adjunct locative phrase, transitive verbs must take an argument locative in order to occur in locative inversion. In addition, I have

suggested that transitive verbs that enter locative inversion are detransitivized, by which the external argument is suppressed in the argument structure. In the next section, we will see that the detransitivized verbs actually display a wider distribution in terms of verb types in locative inversion. With respect to auxiliary selection, however, they behave the same as intransitive verbs.

3. Auxiliary selection

So far we have considered what types of verbs can enter locative inversion in terms of argument structure. We are now ready to consider these verbs with respect to semantic properties and find out which aspect marker these verbs select. We will examine three broad classes: verbs denoting change, verbs denoting states, and verbs denoting processes. In (18)–(24) and (26) below, the (a) sentences include intransitive verbs while the (b) sentences include detransitivized verbs.

3.1 Verbs of change

First, we consider verbs whose meanings include change. These verbs indicate either a change of location, involving an entity going from one location to another, or a change of state, whereby an entity transforms to another state. For change of location, only *-le* marking is possible. This is shown in (18):

- (18) a. Duimian lai -le/*-zhe yiliang che
 opposite-side come -LE/-ZHE one-CL car
 'From the opposite side came a car.'
- b. Dishang reng -le/*-zhe xuduo guopi zhixie
 ground-on throw -LE/-ZHE many peels paper
 'On the ground many peels and paper were thrown.'

Similarly, for change of state, if the change is definite and has reached a resultant state, then *-le* is selected:

- (19) a. Lanzi li lan- le/*-zhe yige pingguo
 basket in rot- LE/-ZHE one-CL apple
 'In the basket rotted an apple.'
- b. Panli qie-le/*-zhe jipian huanggua
 plate-in cut-LE/-ZHE a-few-CL cucumber
 'On the plate cut a few pieces of cucumber.'

If the change is indefinite and has not reached a resultant state, however, either *-le* or *-zhe* is selected. (20) is indefinite change of location (directed motion), and (21) is indefinite change of state:

- (20) a. Nar mao-le/-zhe yigu yan
 over-there rise-LE/-ZHE one-CL smoke
 ‘Over there rises some smoke.’
 b. Jiaoshipang sheng-le/-zhe yimian qi
 classroom-by raise-LE/-ZHE one-CL flag
 ‘By the classroom is raising a flag.’
- (21) a. Tianli zhang-le/-zhe xuduo daozi
 field-in grow-LE/-ZHE many rice
 ‘In the field is growing a lot of rice.’
 b. Guoli zhu -le/-zhe fan
 pot-in cook -LE/-ZHE rice
 ‘In the pot is cooking some rice.’

The detransitivized verbs behave the same as intransitive verbs with respect to the selection of aspect markers. The only difference between the two is that in the former it is understood that the situation is brought about by an external force, whereas in the latter the situation arises by natural force; no external force is implied.

Thus eight verb types are included under the category of change, which is classified in terms of three features: intransitive vs. detransitivized, definite vs. indefinite change, change of location vs. change of state. Of the eight types, only intransitive definite change of location, e.g. *lai* ‘come’ and detransitivized indefinite change of state, e.g. *zhu* ‘cook’ have been mentioned in previous literature. The former is referred to in Yang and Pan (2001) as (dis)appearance verbs, while the latter is called verbs of treatment. The other six types have not been studied before.

3.2 States

Next, we consider verbs whose meanings include the concept of ‘no change’. These verbs are generally stative. Two subtypes are covered: verbs that describe continuation of a pre-existing condition and verbs that describe existence of state. Consider existence of state first. These verbs include intransitive verbs of simple position, such as *zuo* ‘sit’, *zhan* ‘stand’, and verbs of spatial configuration, such as *wei* ‘surround, gather’; they also include detransitivized verbs of spatial configuration, such as *gua* ‘hang’ and detransitivized verbs of putting, such as *fang* ‘put’.¹ These verbs have been considered (Huang 1987; Yu 1995; Hu 1995; Pan 1996; Yang & Pan 2001) as some of the typical verbs that occur in locative inversion, and as noted by Yu (1995), these verbs show variable marking, as illustrated in (22)–(23):

1. Verbs of creating an entity at a location, e.g. *xie* ‘write’, *hua* ‘draw’ are also included in this category.

- (22) a. Menkou zuo-le/-zhe yige jingwei
 doorway sit-LE/-ZHE one-CL guard
 'At the doorway sits a guard.'
- b. Qiangshang gua -le/-zhe yifu hua
 wall-on hang -LE/-ZHE one-CL painting
 'On the wall hangs a painting.'
- (23) a. Jiekou wei -le/-zhe yiqun ren
 street-corner surround -LE/-ZHE one-group people
 'At the street corner gathered a group of people.'
- b. Zhuoshang fang-le/-zhe yiben shu
 table-on put-LE/-ZHE one-CL book
 'On the table lies a book.'

However, further examination reveals that variability disappears in certain contexts. For example, if the argument is inanimate, then only *-zhe* marking is possible, as in (24).

- (24) a. Menkou zuo *le/-zhe yi dui shishi
 doorway sit -LE/-ZHE one pair stone-lion
 'At the doorway sits a pair of stone lions.'
- b. Tianshang gua-*le/-zhe yi lun mingyue
 sky-on hang-LE/-ZHE one -CL bright-moon
 'In the sky hangs a bright moon.'

(24a) can be compared with (22a), which has the same verb *zuo* 'sit', but with an animate argument. This might suggest that animacy is a factor for existence of state in the choice of auxiliary. However, on this analysis there is a puzzle: de-transitivized spatial configuration verbs, which so far have patterned the same as intransitive spatial configuration verbs, don't seem to be affected by animacy. In (22b) the argument is also inanimate, but the verb *gua* 'hang', which is the same verb as in (24b), can be marked either way. On close examination, we see that although in both sentences the verb *gua* 'hang' describes a state of existence, there is a difference in how the two states come into existence. In (22b) the state of hanging exists as a result of a volitional act, whereas in (24b) the state of hanging exists as a result of natural force. In other words, in (22b) the hanging of a painting requires an agent, while in (24b) the hanging of the moon does not. Similarly, the contrast between (22a) and (24a) is also due to volitionality. A guard sitting is a volitional act, whereas a stone lion sitting is not. When volitionality or agentivity is absent, variation also disappears. As a result, only *-zhe* is selected. Hu (1995) also notes that (24b) cannot be marked by *-le*. He does not mention agentivity; rather, he suggests that *-le* implies a resultative state, and it cannot be used here because the position of the moon cannot be the result of some previous action of hanging.

This explanation is actually compatible with the explanation offered here, since the action of hanging an object is agentive.

Therefore, it appears that the way a state comes about matters to the choice of auxiliary. If volitional control is involved in bringing about the existence of the state, then either marking is possible; if, on the other hand, no volition is involved, only *-zhe* marking is possible. Positional verbs with animate argument and de-transitivized spatial configuration verbs imply a preceding volitional act, whereas positional verbs with inanimate verbs do not. This explains the paradigm exhibited by (22)–(24). Thus it is not animacy, but agentivity or volitionality, which is responsible for the behavior of these sentences.

Simple position verbs are also subject to event shifting, whereby the same verbs change from simple position verbs to ‘assume position’ verbs. This happens when the context implies a change of state. In this circumstance, only *-le* marking is possible, even though the structure remains the same. This is shown in (25):

- (25) Gangcai dianli yige ren ye meiyou, zenme yixiazi
 just-now store-in one-CL person also not-exist how-come suddenly
 wei -le/*-zhe zheme duo ren
 gather -LE/-ZHE so many people
 ‘Just now there was nobody in the store; how come suddenly gathered so many people?’

(25) has the ‘assume position’ reading, not the simple position reading.

In short, simple positions verbs can be marked either by *-le* or *-zhe*; however, the variability is subject to whether the existence is understood to be brought about by an agent. If no agent is involved, the verb selects *-zhe* only. On the other hand, implication of change of state, hence telicity, shifts an event from one of simple position to one of assume position, and limits the choice of auxiliary to *-le* only.

In contrast to existence of state, verbs that denote continuation of a pre-existing state have not been observed in previous studies. These verbs exhibit a pattern very similar to existence of state. Variability in the choice of auxiliary is seen in (26):

- (26) a. Keting yijing kong le, fanning hai liu -le/-zhe
 living-room already empty PRT, dining-room still remain -LE/-ZHE
 yizhang yizi
 one-CL chair
 ‘The living room is already empty; in the dining room still remains a chair.’
 b. Yinhangli cun-le /-zhe yidian qian
 bank-in keep-LE /-ZHE a-little money
 ‘In the bank is kept a little money.’

However, just like the simple position verbs, variability is not always possible, and its availability depends on whether agentivity is implied. When a state is maintained because of the involvement of an agent, either *-le* or *-zhe* is used; otherwise, only *-zhe* is selected. This explains the variability in (26a, b), as leaving a chair in a room and keeping money in a bank both involve volitionality. (27) further shows that the same verb *liu* 'leave behind' can be interpreted either volitionally or non-volitionally, depending on the internal argument:

- (27) a. Menshang liu *-le/-zhe* yige zitiao
 door-on leave *-LE/-ZHE* one-CL note
 'On the door was left a note.'
- b. Chengshili hai liu **-le/-zhe* zhanzheng de yiji
 city-in still leave *-LE/-ZHE* war DE relics
 'In the city are still left relics of the war.'

In (27a), a note on the door is a result of someone's volitional act; the note cannot appear on the door by itself. In this case, either *-le* or *-zhe* is possible. In (27b), on the other hand, relics of the war were left behind without intervention of an agent. In such a case, only *-zhe* can be used. Thus the choice of auxiliary varies according to whether *liu* is agentive or non-agentive.

3.3 Processes

Finally, we consider verbs of dynamic processes. These verbs include neither change nor a state in their meanings. Processes are either volitional or non-volitional. For non-volitional processes, only *-zhe* is possible:

- (28) a. Waitou chui **-le/-zhe* xie weifeng
 outside blow *-LE/-ZHE* some breeze
 'Outside is blowing some breeze.'
- b. Ta shenshang liu **-le/-zhe* zhongguoren de xueye
 he body-on flow *-LE/-ZHE* Chinese DE blood
 'In his body flows Chinese blood.'

When it comes to volitional processes, however, a mixed picture emerges. Detransitivized verbs select *-zhe* only, as in (29); intransitive verbs, however, generally don't occur in locative inversion, as shown in (30):

- (29) Zuili jiao **-le/-zhe* kouxiangtang
 mouth-in chew *-LE/-ZHE* chewing-gum
 'In the mouth is chewing some gum.'
- (30) a. *Yaolanli ku *-zhe* yige xiao yinger
 crib-in cry *-ZHE* one-CL small infant
 'In the crib is crying a small infant.'

- b. *Chili you -zhe yige nianqing ren
 pool-in swim -ZHE one-CL young man
 'In the pool is swimming a young man.'
- c. *Caochangshang tiao-zhe yige xuesheng
 field-on jump-ZHE one-CL student
 'In the field is jumping a student.'

However, two verbs – *pao* 'run' and *zou* 'walk' – are exceptions to this pattern, as in (31)–(32):

- (31) Qianmian zou -zhe yige ren
 front-side walk -ZHE one-CL person
 'In front walks a person.'
- (32) Lushang pao-zhe yige ren
 road-on run-ZHE one-CL person
 'On the road runs a person.'

Both verbs can enter into locative inversion. Yu (1995) and Yang & Pan (2001) include *pao* 'run' in their examples, and Yu's examples also include *zou* 'walk'. This shows that verbs of controlled processes don't behave uniformly with respect to whether they enter locative inversion.

(30b) can be contrasted with (33), where the same verb *you* 'swim' is used, except that it denotes an uncontrolled process:

- (33) Chili you -zhe yixie yazi
 pool-in swim -ZHE some ducks
 'In the pool are swimming some ducks.'

This contrast is also noted by Yang & Pan (2001:202). According to them, the contrast between (30b) and (33) is a consequence of a pragmatic requirement, referred to as "compatibility requirement", on existential sentences. For dynamic manner verbs, the verbs have to describe a typical kind of movement of an entity. Swimming is a typical movement of ducks, but not of human beings; on the other hand, running is a typical movement of human beings. This explanation is similar to Birner's (1994) study regarding the discourse function of existential sentences in English. Birner says that in inversion, the information carried by the post-verbal NP is less familiar than the information carried by the pre-verbal PP; further, the verb does not carry new information – it is informationally-light. In this context, we can see that movements typical of an entity carry a lighter load of information than movements that are not typical of an entity.

This view can be used to explain some of the restrictions observed in Chinese, e.g. why *tiao* 'jump' cannot occur in locative inversion, as in (31c). Jumping is not informationally light in this context, but rather carries new information. However, discourse function alone does not seem to be adequate in explaining the entire

range of Chinese data. Under this analysis, it is difficult to explain why except for *pao* 'run' and *zou* 'walk', no other verbs of volitional processes can occur in locative inversion.

The following table summarizes the pattern of auxiliary selection that we have observed so far:

| (34) | Verb Types | Auxiliary |
|------|---|--------------------------------------|
| | change of location/state – definite | -le |
| | – indefinite | -le /-zhe |
| | continuation of state, existence of state – agentive | -le /-zhe |
| | – non-agentive | -zhe |
| | non-volitional process | -zhe |
| | volitional process (detransitivized) | -zhe |
| | volitional process (intransitive), except for <i>pao</i> 'run' and <i>zou</i> 'walk' | does not enter locative inversion |

4. Semantic determinants

In this section we will consider what semantic properties are relevant for the choice of auxiliary in locative inversion. Before I offer my analysis, however, I will say a few words about Hu (1995) and Yang and Pan (2001). As mentioned in Section 1, they also offer a semantic analysis of auxiliary selection.

4.1 Hu (1995) and Yang and Pan (2001)

Hu's main concern is to characterize the verbs that can occur in presentative sentences, which correspond to locative inversion discussed here. He argues that the aspectual nature of the verbs determines whether they can occur in presentative sentences; further, the choice of aspect markers is determined by the aspectual nature of the verbs. Three groups of verbs are identified to enter presentative sentences: verbs denoting change of state, verbs denoting state, and verbs denoting resultative state. Change of state and resultative state select *-le*, while state selects *-zhe*. However, Hu does not recognize variability of choice of auxiliary; instead, when either choice is possible, he says there is a subtle difference in meaning between the two forms. According to him, (35a) describes a state as a result of some previous action, while (35b) describes an on-going state:

- (35) a. Qiangshang gua -le yifu hua
 wall-on hang -LE one-CL painting
 'On the wall hangs a painting.'

- b. Qiangshang gua-zhe yifu hua
 wall-on hang-ZHE one-CL painting
 'On the wall hangs a painting.'

Yang and Pan (2001) follow Hu and also take the aspectual properties of verbs as determinants of choice of auxiliary, although the details are not identical: change of state selects *-le*, resultative states select *-zhe*, and activities select *-zhe*. For verbs that exhibit variability, Yang and Pan suggest that the choice has to do with what the speaker wishes to emphasize; an emphasis on the change will result in the choice of *-le*, while an emphasis of the resultative state will result in the use of *-zhe*. Thus for them (35a) implies that the state of picture hanging was not true in the past.

While neither study gives a complete picture, due to the narrow range of verbs considered, they have identified a major factor for the choice between *-le* and *-zhe* by associating change of state with *-le*. However, both studies are reluctant to acknowledge the existence of variability. Hu mentions subtle differences between the choices, while Yang and Pan talk about the speaker's emphasis. Actually, in a situation where a picture is hanging on the wall, when asked if (35a) and (35b) can be used to describe the situation, almost all speakers respond positively, and most of them do not perceive a difference in meaning between the two sentences. In the next section, I will offer three factors to account for both the choice of marking and the variability.

4.2 Three factors

Three semantic factors can be identified which account for the pattern observed in (34). Telicity is the primary factor, which divides all of the verbs into two groups: telic verbs, including verbs of change, and atelic verbs, including verbs of state and verbs of process. Telic verbs select *-le*. Difference in degrees of telicity is reflected in whether *-zhe* can also be selected. Verbs of definite change select *-le* only, while verbs of indefinite change select *-le* or *-zhe*. In contrast, atelic verbs all select *-zhe*; two other factors determine whether they also select *-le*: stativity and agentivity.

Stativity divides atelic verbs into two groups: stative verbs and dynamic verbs; the latter are verbs of process. Dynamic atelic verbs (verbs of process) select *-zhe* only; as for stative atelic verbs, they are yet divided into two groups in terms of agentivity. Stative verbs that are non-agentive select *-zhe* only, while agentive stative verbs select *-zhe* or *-le*. The overall picture is a hierarchy given in (36):

(36) Hierarchy of auxiliary selection in Chinese

| Semantic Properties | Verb Types | Auxiliary |
|-------------------------------|---------------------|-----------|
| telic | change (definite) | -le |
| telic | change (indefinite) | -le/-zhe |
| atelic, stative, agentive | state | -le/-zhe |
| atelic, stative, non-agentive | state | -zhe |
| atelic, dynamic | process | -zhe |

The three factors are not equal in terms of importance. Telicity is the most dominant factor. If a verb is telic, the other two factors are irrelevant; it selects *-le* regardless whether it is stative or agentive. Thus telic agentive, e.g. *lai* 'come', has the same marking as telic non-agentive, e.g. *lan* 'be rotten'; and telic stative, e.g. *po* 'be broken', is marked the same as telic dynamic, e.g. *zou* 'leave'. The factor that is next in ranking is stativity. If a verb is atelic and dynamic, then it selects *-zhe* regardless of agentivity. That is, all types of process select *-zhe*, whether it is volitional, e.g. *jiao* 'chew', or non-volitional, e.g. *piao* 'flow'. The last factor, agentivity, is relevant only when a verb is atelic and stative. That is, it is only relevant when a verb denotes a state. A state that is brought out by volition takes either *-le* or *-zhe*, whereas a state that exists without intervention of an agent takes *-zhe* only.

Telicity and stativity are both properties of lexical aspect. In Dowty's (1979) verb classification, telicity distinguishes accomplishments and achievements from states and activities, while stativity separates states from the other three classes. In Smith (1997), telicity and stativity are two of the three features that define situation types. Therefore, overall, auxiliary selection in Chinese is governed by lexical aspect and agentivity.

(36) can be compared with the hierarchy proposed by Sorace (2000) for auxiliary selection in Germanic and Romance languages, given in (37):

| | |
|------------------------------------|--------------------------|
| (37) Auxiliary selection hierarchy | Sorace (2000) |
| change of location | (least variation) 'be' |
| change of state | |
| continuation of pre-existing state | |
| existence of state | |
| uncontrolled process | |
| controlled process (motional) | |
| controlled process (non-motional) | (least variation) 'have' |

Sorace's hierarchy is set up based on telicity and agentivity. She takes a gradient approach. Verbs are distinguished into core and intermediate verbs. Core verbs are at the ends of the hierarchy; they show consistent marking, while intermediate verbs are in the middle of the hierarchy, and they show variable marking.

As we compare the two hierarchies, we note that the types of verbs that occur in the Chinese hierarchy are similar to the types of verbs listed in (37), but differ from the latter in terms of classification. Different types of changes and processes in (37) are collapsed in (36); on the other hand, states are distinguished in terms of agentivity in (36), a distinction lacking in (37). However, there are some striking similarities between the two hierarchies. First, just like (37), in the Chinese hierarchy verbs at the ends of the hierarchy show consistent marking, while verbs in the middle show variable marking. Second, both hierarchies include telicity and agentivity as determinants; further, the degree of telicity determines the degree to which the choice of 'be' or *-le* is categorical. Thus the Chinese data supports Sorace's gradient approach to auxiliary selection.

There are also a number of differences between (36) and (37). First, since not all intransitive verbs occur in locative inversion, (36) includes only a subset of intransitives in Chinese, whereas (37) covers a full range of intransitives in Germanic and Romance languages. On the other hand, (36) also applies to detransitivized verbs, although the two classes of verbs differ in terms of the verb types included in the hierarchy. For intransitive verbs, agentive process is excluded except for *pao* 'run' and *zou* 'walk'; for detransitivized verbs, the full range of verb types is included. Another difference between (36) and (37) has to do with the division of labor among the factors. In (37), telicity and agentivity are relevant, but stativity is not. Sorace does not specify whether the two are comparable or ranked in terms of importance. It seems telicity should be ranked higher because while telic verbs (definite change) select 'be' regardless of agentivity, agentive verbs do not select 'have' regardless of telicity. Rather, only atelic, agentive verbs select 'have'. In (36), as mentioned earlier, telicity plays a much more prominent role, while agentivity is relevant only to states. Yet another difference concerns the nature of variation observed in these languages. Chinese verbs exhibit less variation than verbs in Romance or Germanic languages in terms of both types of verbs and the nature of variation. Two types of verbs in (36) show variation in Chinese – indefinite change and state, while in Romance and Germanic languages most of the eight types in (37) display some degree of variation, with the middle showing the greatest variation. As to the nature of variation, in Chinese it seems that not much variation exists among native speakers. Judgments converge more or less as to whether a verb selects *-le*, *-zhe* or either. There is also less individual differences among verbs of the same type in Chinese. For example, when agentivity is implied, all stative verbs show variation. By contrast, in Romance and Germanic languages, more variation is seen among speakers as well as among individual verbs.

5. Syntactic approaches

We now turn to the issue whether the data presented in Section 3 can be characterized in a syntactic analysis. Since auxiliary selection classifies verbs into *-le* marking verbs and *-zhe* marking verbs, a natural question to ask is whether the distinction is the unaccusative/unergative distinction, explained by the Unaccusativity Hypothesis. As mentioned in Section 1, in Germanic and Romance languages auxiliary selection has been considered as an unaccusative diagnostics. Is auxiliary selection in Chinese also a syntactic manifestation of unaccusativity? Below I will present arguments from two perspectives and suggest that a syntactic analysis of the phenomenon is untenable.

If auxiliary selection is a characteristic of unaccusativity, two things should follow: First, we would expect to see other syntactic manifestations whereby intransitive verbs are distinguished into two classes along the same line and the difference is explained by the Unaccusativity Hypothesis. Second, earlier in Section 2, I have suggested that detransitivized verbs in locative inversion suppress their external argument. Given this, in a syntactic analysis, we would expect all of the detransitivized verbs to select *-le* uniformly, in the same way that passive verbs and reflexive verbs in Germanic and Romance languages select 'be' (Perlmutter 1978; Burzio 1986). Neither prediction is borne out, however. As for the latter, it is contradicted by the data presented in Section 3. There we saw that detransitivized verbs also show variable behavior; just like intransitive verbs, they select *-le*, *-zhe* or either. Further, except for controlled processes, the selection follows the same broad classification, i.e. change, state, process for both intransitive and detransitivized verbs.

As for the former prediction, so far two phenomena have been proposed (Yu 1995) as unaccusative diagnostics, but as I show in 5.2, under close scrutiny they are not really unaccusative diagnostics. In fact, in studies of Chinese there has been no consensus on what is an unaccusative diagnostic or which verb types (e.g. change, state, process) are unaccusative. Below I will review three previous studies: Huang (1990), Yu (1995) and Pan (1996).

5.1 Huang (1990)

Huang (1990) suggests that in Chinese verbs of existence, (dis)appearance and location have an underlying object, but no subject; they are unaccusative. On the other hand, agentive verbs such as *ku* 'cry' and *tiao* 'jump' have an underlying subject; they are unergative. The underlying representation of (38a) and (39a) is (38b) and (39b), respectively:

- (38) a. Ren si le
 person die LE
 'This person is dead.'
- b. [e] si le ren le.
 die LE person PRT
 'Someone is dead.'
- (39) a. Yiwai zhongyu fasheng le
 accident finally happen LE
 'The accident finally happened.'
- b. [e] zhongyu fasheng yiwai le
 finally happen accident LE
 'An accident finally happened.'

Huang says a strong piece of evidence for assigning these verbs an object, but not subject, is that the 'inverted' structures of (38b) and (39b) are also well-formed. In contrast, with unergative verbs, such inversion is not possible:

- (40) a. *Hen gaoxing yige ren
 very happy one-CL person
 'A person is very happy.'
- b. *Zheli ku-le sange ren
 here cry-LE three-CL person
 'Here three people cried.'

That is, unaccusative verbs allow their single argument to occur in the object position at the surface structure. Another piece of evidence for the unaccusative/unergative distinction that Huang offers is that the subject of unergative verbs is usually the agent, which is the external argument, while the subject of unaccusative verbs is usually a non-agent, corresponding to an internal argument. In (38a) and (39a) the subject is a theme, not agent. Therefore, the two types of verbs also differ in that unergative verbs have the external argument, while unaccusative verbs have no external argument, but an internal argument.

Huang seems to take inversion as an unaccusative diagnostic. This means all of the intransitive verbs that enter locative inversion would be unaccusative in his analysis. Auxiliary selection therefore plays no role in unaccusativity. This view is also held in Gu (1992) and Li (1990). Thus unaccusative verbs would include not only verbs of existence, (dis)appearance and location, but also verbs of processes, eg. *piao* 'float', *chui* 'blow' and *pao* 'run'. This raises some doubt, as cross-linguistically the latter verbs are unergative. Further, on the assumption that locative inversion is an unaccusative diagnostic, the post-verbal NP is an object in the underlying representation. Yet no such evidence is provided. In fact, it is questionable whether all of the post-verbal NPs that occur in the construction originate

as objects. *Pao* 'run', for example, is usually assumed to have an underlying subject, not an underlying object.

5.2 Yu (1995)

Yu (1995) offers a different view of unaccusativity in Chinese. He examines three groups of verbs, each containing six verbs, in locative inversion.² He suggests that verbs that select *-le* are unaccusative, verbs that select *-zhe* are unergative, and alternating verbs, ones that select either *-le* or *-zhe*, are unaccusative. For *-le* marking verbs, the postverbal NP in locative inversion is an underlying object, while for *-zhe* marking verbs, the postverbal NP is an inverted subject, adjoined to VP. For alternating verbs, the postverbal NP is an underlying object when *-le* is selected, and an inverted subject when *-zhe* is selected. He provides two tests that correlate with the *-le/-zhe* selection: the definiteness effect and sub-extraction.

The definiteness effect can be observed in *-le* marking sentences. When the verb is marked by *-le*, the postverbal NP is either indefinite or, if the NP is bare, interpreted as an indefinite expression. In a *-zhe* marking sentence, however, the NP can be definite. This is shown in (41)–(42).

- (41) Duimian lai-le yiliang che /*Laowang de che
opposite-side come-LE one-CL car /Laowang DE car
'From the opposite side came a car/*Laowang's car.'
- (42) Caochangshang pao-zhe yige xuesheng /women de laoshi
playground-on run-ZHE one-CL student /we DE teacher
'On the playground is running a student/our teacher.'

(43)–(44) show that if a verb takes either *-le* or *-zhe*, the NP can be either definite or indefinite when it takes *-zhe*, but the NP must be indefinite when the verb takes *-le*.

- (43) Taishang zuo-zhe sange ren /zhuxi tuan
platform-on sit-ZHE three-CL person /chair committee
'On the platform are sitting three people /the chair committee.'

2. The three groups of verbs are as follows:

G1: *si* 'die', *dao* 'arrive', *lai* 'come', *qu* 'go', *zou* 'leave', *pao* 'run away'
G2: *zhan* 'stand', *zuo* 'sit', *dun* 'squat', *gui* 'kneel', *tang* 'lie', *pa* 'lie on stomach'
G3: *zou* 'walk', *pao* 'run', *fei* 'fly', *pa* 'crawl', *tiao* 'jump', *gun* 'roll'
Verbs in G1 select *-le*; verbs in G2 select *-le* or *-zhe*, and verbs in G3 select *-zhe*.

- (44) Taishang zuo-le sange ren /*zhuxi tuan
 platform-on sit-LE three-CL person /chair committee
 'On the platform are sitting three people/*the chair committee.'

The second test, sub-extraction, has to do with extracting the head of the postverbal NP to a pre-verbal position. It is possible with a *-le* marking verb, as illustrated in (45):

- (45) Nage diqu ren si-le xuduo
 that area people die-LE many
 'In that area people died many.'

In (45), the head *ren* 'people' is preposed to a pre-verbal position, leaving behind the quantifier phrase *xuduo* 'many': (46) shows that sub-extraction of the head NP is not possible with *-zhe* marking verbs.

- (46) *Caochangshang xuesheng pao-zhe xuduo
 playground-on student run-ZHE many
 'On the playground students were running many.'

If a verb can take either *-le* or *-zhe*, then sub-extraction is possible when it is marked by *-le*, but not when it is marked by *-zhe*. This is illustrated in (47):

- (47) Menkou ren zhan-le /*-zhe jige
 doorway people stand-LE /-ZHE a-few
 'At the doorway people stood a few.'

In Yu's analysis, auxiliary selection is one of the three syntactic manifestations of unaccusativity, together with the definiteness effect and sub-extraction. However, although the latter two phenomena correlate with auxiliary selection, neither the definiteness effect nor sub-extraction is an unaccusative diagnostic in the strong sense. Levin and Rappoport Hovav (1995:4) point out that in order for a phenomenon to be considered as an unaccusative diagnostic, the difference between the two classes of verbs needs to be explained by different syntactic configurations. In the case of definiteness effect or sub-extraction, there is no independent evidence that links them to the distinction between an object and a non-object. That is, it is not shown independently that in locative inversion, NPs in the object position, but not in other positions, must be indefinite, nor that sub-extraction is only possible in the object position, but not in other positions. Rather, Yu simply characterizes the differences in terms of differences in syntactic configurations. In fact, neither the definiteness effect nor sub-extraction is necessarily a syntactic phenomenon. In recent literature there have been semantic (Keenan 2003) and pragmatic (Abbott 1993; Zucchi 1995) accounts of the definiteness effect. As for sub-extraction, it is subject to discourse constraints. Sub-extraction involves mov-

ing a post-verbal NP to a pre-verbal position, where an NP typically carries old information. If a post-verbal NP carries new information, when it is extracted to a pre-verbal position, the result is often unacceptable, regardless of whether the verb is marked by *-le* or *-zhe*, as in (48):

- (48) *Cantingli xuesheng zuo-le/-zhe yige
 cafeteria student sit -LE/-ZHE one-cl
 (Lit: 'In the cafeteria, as for students, there sits one.')

Thus the two tests that Yu provides may be explained by semantic, pragmatic or discourse analyses.

Data from detransitivized verbs further undermines a syntactic analysis. The definiteness effect and sub-extraction also divide detransitivized verbs into two groups in the same way as intransitive verbs do – *-le* marking verbs are subject to the definiteness effect but allow sub-extraction, while the reverse holds for *-zhe* marking verbs. (49) illustrates the definiteness effect, and (50) illustrates sub-extraction:

- (49) a. Dishang reng-le xuduo /*zhexie guopi zhixie
 ground-on throw-LE many /*these peels paper
 'On the ground many/*these peels and paper were thrown.'
 b. Zuili jiao-zhe yikuai/ nakuai kouxiantang
 mouth-in chew-ZHE one-CL that-CL chewing-gum
 'In the mouth is chewing a piece of/that piece of gum.'
- (50) a. Guopi zhixie reng -le henduo
 peels paper throw -LE many
 'Many peels and paper were thrown.'
 b. *Kouxiantang jiao-zhe bushao
 chewing-gum chew-ZHE many
 ?*'Many chewing gums are chewed.'

However, as discussed in 2.2, the two types of verbs have the same argument structure – both are assigned an internal argument, with the external argument suppressed. This means syntactic configuration cannot be the source of difference observed in (49)–(50).

In short, while Yu has identified two phenomena that correlate with auxiliary selection, neither is an unaccusative diagnostic; moreover, the pattern displayed by detransitivized verbs cannot be stated as differences in the argument structure or syntactic configuration.

5.3 Pan (1996)

Pan (1996) treats all of the intransitive verbs in locative inversion as unaccusative, just like Huang (1990), but among the detransitivized verbs, only ones that select *-zhe* are unaccusative. As mentioned in Section 2.2, he proposes a rule that operates on a verb's argument structure and deletes the verb's external argument when *-zhe* is present. The derived argument structure is the same as that of an intransitive verb with a Theme argument, and therefore the derived verb, marked by *-zhe*, is considered unaccusative.

On Pan's analysis, auxiliary selection plays a role in unaccusativity only for detransitivized verbs. For him, unaccusative verbs include all types, e.g. change, state, and process, of intransitive verbs; but among detransitivized verbs, only verbs of state (if they select *-zhe*) and process are unaccusative. Notably, detransitivized verbs that denote change are not unaccusative in his analysis. Cross-linguistically, verbs of process are unergative, while verbs of change are unaccusative, and yet Pan has assigned just the opposite status to detransitivized verbs. Since no diagnostics of unaccusativity is provided, it is not possible to evaluate why unaccusative verbs are grouped this way in his analysis.

5.4 Summary

In short, the strongest evidence against a syntactic analysis of auxiliary selection comes from detransitivized verbs. Rather than behaving uniformly, as predicted by a syntactic analysis, these verbs show variability, parallel to intransitive verbs. As for evidence for a syntactic analysis, so far in the literature only Yu (1995) provides it, but his two tests on close scrutiny don't stand up as real syntactic diagnostics. It is also found that of the three syntactic approaches to split intransitivity, none of them have provided a clear unaccusative diagnostic. As a result, many discrepancies are found among the three analyses. There is disagreement on many verb types, e.g. verbs of process, alternating verbs, and detransitivized verbs, with respect to whether they are unaccusative or unergative. Auxiliary selection has been assigned three different roles with respect to unaccusativity: not relevant (Huang), very relevant (Yu) and partially relevant (Pan). Thus not only is the evidence for auxiliary selection as a syntactic manifestation of unaccusativity not strong, the evidence that unaccusativity is syntactically represented in Chinese is also lacking.

6. Conclusion

In this paper I have examined auxiliary selection in Chinese, a phenomenon that is found in locative inversion. Chinese is unique in that both intransitive and detran-

sitivized verbs occur in the construction and both participate in auxiliary selection. I have suggested that this fact is best accounted for in a semantic analysis. Three semantic factors have been identified that are responsible for the hierarchy of Chinese auxiliary selection: telicity, stativity and agentivity, in order of importance. There are thus two semantic dimensions that Chinese auxiliary selection is sensitive to – lexical aspect, including telicity and stativity, and agentivity. Van Valin (1990) proposes that lexical aspect and agentivity are the semantic basis for split intransitivity cross-linguistically. Data from Chinese auxiliary selection certainly reinforces this claim.

I also considered whether auxiliary selection in Chinese is a syntactic manifestation of unaccusativity. This question turns out to be difficult to answer because there is little agreement in previous analyses as to what is an unaccusative diagnostic in Chinese. Two tests have been proposed that correlate with auxiliary selection; however, both lack independent evidence as unaccusative diagnostics. This, together with data from detransitivized verbs, suggests that a syntactic analysis of auxiliary selection is not the right way to go.

In sum, the Chinese data supports a semantic analysis of auxiliary selection. This does not mean that a syntactic analysis of split intransitivity cannot be put forward for Chinese, but at least one phenomenon – auxiliary selection – argues for a semantic account of split intransitivity.

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