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Aspect, Distributivity, and *Wh*/QP Interaction in Chinese*

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This work investigates some fundamental problems in *Wh*/QP interaction in Chinese. This work first points out that Chinese actually does not exhibit the same kind of *Wh*/QP interaction as English does, and then shows that aspect plays a crucial role in restricting the possible readings of the relevant sentences. Three observations are made: (1) The aspect of a sentence has a direct bearing on the availability of the list reading. (2) The aspect of a sentence is closely related to the type of situation quantification permitted of the sentence. And (3) the aspect of a sentence has a strong effect on the possible semantic interpretation of the numeral object. It is proposed that these three observations fall out naturally on an approach that makes a distinction between the type and the token of an event. A type of event is an open event that has to be quantificationally closed off by the aspect of the sentence. Two types of aspectual closure are provided by the grammar of Chinese, existential and generic. Existential closure arises when the head of AspP contains aspectual features and the main verb of the sentence incorporates to it for checking. On the other hand, the generic aspect arises when the generic operator **Gen** occupies the head of AspP and blocks head incorporation of the main verb of the sentence. These proposals are shown to account successfully for the three observations mentioned above as well as the distributivity properties of the relevant sentences.

Key words: *Wh*/QP interaction, verb movement, aspect, distributivity

In this article we investigate some fundamental questions related to the *Wh*/QP interaction in Chinese. The focus of this article is aspect and its impact upon the possible readings of the Chinese sentences. In section 1 we point out that the *Wh*-phrase and the quantificational phrase in Chinese actually do not interact the way they do in English. In section 2 three observations are made, all of which are related to the

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presence or absence of the aspectual markers and their effects on the possible readings of Chinese sentences. In section 3 a unified explanation is proposed, which is based on the assumption that distributivity is correlated with existentiality of event. Technically speaking, the element that the functional head Asp hosts exerts a profound effect on the possible interpretations of the sentence. If Asp hosts the aspectual feature, then the verb of the sentence must be suffixed with an aspectual marker. Verb movement must then apply to check the aspectual feature, yielding existential closure of the event argument as a consequence and sanctioning a distributivity relation. On the other hand, if Asp hosts the generic aspect **Gen**, the event argument will not be existentially closed, and as a result the distributivity relation cannot hold. This article also discusses the distributive force of the adverbs of quantification *dou* and *ge* in Chinese, and shows that the behaviors of *dou* and *ge* support the assumption that distributivity and existentiality of event are correlated. Section 4 is a summary.

1. The *Wh*/QP interaction in English and Chinese

1.1 Examples and readings

Below are examples of *Wh*/QP interaction in English and Chinese (see May 1985 and Aoun and Li 1993, among others):

(1) a. What did everyone buy for Max?
b. Who bought everything for Max?

(2) a. Meige ren dou gei Laowang mai-le shenme?
every person all for Laowang buy-PERF what
'What did everyone buy for Laowang?'
b. Shei gei Laowang mai-le meiyang dongxi?
who for Laowang buy-PERF every thing
'Who bought everything for Laowang?'

As is now well known, the English example in (1a) is ambiguous in allowing the *individual* reading and the *pair-list* reading (as Hornstein 1995 calls them). Example (1b), on the other hand, is not ambiguous; it permits the individual reading only. The Chinese counterparts in (2a-b), according to Aoun and Li (1993), exhibit the same asymmetry as the English examples in (1a-b). In this article we shall be focusing on the (2a) type of sentences. To begin with, it should be pointed out that the problem in the possible readings of (1-2) is in fact more complicated than as just described. In fact, the English example in (1a) is three-ways ambiguous. The readings are characterized below.

(I) The individual reading: The *Wh*-object takes wider scope than the universal QP-subject, and the QP-subject is interpreted collectively. Under this reading, a possible answer to the question would be: *Everyone bought Empire State Building for Max.*

(II) The pair-list reading 1, which we shall call the *list reading*: The QP-subject takes wider scope than the *Wh*-object, and the QP-subject is interpreted distributively. A possible answer to the question would be: *John bought an airplane, Mary bought a space shuttle, Bill bought an artificial satellite ... for Max.*

(III) The pair-list reading 2, which we shall call the *token reading*: The QP-subject takes wider scope than the *Wh*-object with distributive interpretation, but the *Wh*-object represents tokens of the type of an individual; e.g., different copies of a book. A possible answer to the question, under this reading, would be: *Everyone bought Sigmund Freud's* The Interpretation of Dreams *for Max.*[1]

Now let us turn to the Chinese example in (2a). According to Aoun and Li (1993), (2a) exhibits the same ambiguity as (1a). Upon further scrutiny, however, we find that (2a) can only assume the two distributive readings in (II) and (III), that is, the list reading and the token reading.[2] The individual reading is not possible for (2a). The

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[1] Thanks to an anonymous reviewer for comments and suggestions on this reading. The same reviewer also points out that, in a sense, the token reading can also be termed the "internal list reading" in contrast with the reading in (II), which could be called the "external list reading". This reading can be called the internal list reading since it is analogous to the readings of the following question sentences:

(i) a. What did everyone buy a copy of *t*?
b. Who did everybody buy three pictures of *t*?

The readings of (ia-b) are individual readings in terms of the scope of the *Wh*-words *what* and *who*, since they take the widest scope; however, the readings of these two sentences are list readings in terms of the entities being bought, that is, [*a copy of* t] and [*three pictures of* t]. In this sense (ia-b) can be said to assume a list reading internal to an individual reading. For ease of reference, we shall use "token reading" for this reading throughout the work.

[2] In addition to the list and token readings, there is a third distributive reading available for sentences of (1a) and (2a) types, known as the *functional reading* (see Engdahl 1985 and Chierchia 1991 for more details). This reading is demonstrated in the following examples:

(i) a. Who did everyone admire?
b. His mother.

(ii) a. Meige ren dou mai-le shenme?
every person all buy-PERF what
'What did everyone buy?'

b. Meige ren dou mai-le ziji zui xihuan de shu.
every person all buy-PERF self most like MOD book
'Everyone bought the book that s/he likes most.'

discrepancy between the case of English and that of Chinese is most obvious in the following situation. The token reading is possible only when the verb-object relation can be "stagized" (in the sense of "stages" in Carlson 1977).[3] For example, students can buy different copies of a book, boys can (in certain sense) love different percepts of a girl, but soldiers *cannot* kill different stages of an enemy in the real world, due to the nature of the semantics of the predicate *to kill someone*. Consider the following sentences:

(3) a. Who did everyone kill?
a.i. John killed Lincoln, Mary killed Gandhi, Bill killed J. F. Kennedy ...
a.ii. Everyone killed Hitler.
b. Meige ren dou shasi-le shei?
every person all kill-PERF who
'Who did everyone kill?'
b.i. Laozhang shasi-le Zhang Fei, Xiaoli shasi-le Yue Fei,
Laozhang kill-PERF Zhang Fei Xiaoli kill-PERF Yue Fei
Laowang shasi-le Wen Tianxiang....
Laowang kill-PERF Wen Tianxiang
'LZ killed ZF, XL killed YF, LW killed WTX....'
b.ii. #Meige ren dou shasi-le Cixi Taihou.
every person all kill-PERF Cixi queen
'Everyone killed the Empress Dowager.'

When we change the predicate to one that does not permit stage interpretation, the ambiguity of (2a) type of sentences disappears. In English, on the other hand, ambiguity is still observed. In (3a-b), for instance, the predicate is changed to 'to kill someone'. Practically, an individual life cannot be slaughtered stage by stage, thus the token reading is not available. (As an anonymous reviewer points out, there can be

It is likely that the functional answer such as (ib) and (iib) is a sub-type of the list reading, with additional binding of a variable into the object NP by the subject universal quantifier. We shall not go into discussion of this type of reading, as it does not bear directly on the major issues in this work.

[3] The term *stage* employed here is intended to refer to the notion of stage in Carlson's (1977) proposal, rather than the notion of stage in the distinction between the stage-level predicate and individual-level predicates discussed in Kratzer (1988) and Diesing (1992) (even though the latter is derived directly from the former). In Carlson's original proposal of the notion, stages are realizations of individuals, which are names of kinds. For example, the kind *wolf* may have millions of stages, that is, millions of living wolves, in the world. In this article we assimilate the relation between books and their copies to the one between names of kinds and their stages.

many instances of dying—as is happening each day—but there cannot be more than one instance of killing a particular person, say J. F Kennedy). With this in mind, let us compare (3a) with (3b). With the predicate 'to kill someone', we find that the English example in (3a) is still ambiguous, as it permits the list reading (3a.i) and the individual reading (3a.ii). The Chinese example in (3b), however, shows no ambiguity at all, as it permits the list reading only. It is thus clear that the *Wh*-object and the QP-subject in sentences of (2a) type *do not* interact in the same way as their counterparts in English.

1.2 Isomorphism and adverbs of quantification

Based on the observations presented above, it can be claimed that Chinese does not exhibit *Wh*/QP interaction of the English kind as claimed by Aoun and Li (1993). In sentences of (2a) type, the QP-subject isomorphically scopes over the *Wh*-object in a distributive way. Why is it the case? This clearly has to do with the function of the adverb of quantification (QAdv) *dou* 'all'. Many researchers have observed the distributive function of *dou* (see J. Lin 1996 and Li 1997, among many others). As *dou* quantifies over the QP-subject distributively, there is no chance for the QP-subject to be interpreted collectively. A natural inference that comes to mind at this point is that, if we replace *dou* 'all' with some other QAdv with collective force, the interpretation of the QP-subject will be different. This inference turns out to be correct. Look at the following examples:

(4) a. Dajia dou wei ziji yingzao yige meihao-de jiayuan.
everybody all for self establish one nice-MOD home
'Each person established a nice home for him-/herself.'
b. Dajia gongtong yingzao yige meihao-de jiayuan.
everybody collaboratively establish one nice-MOD home
'Everyone collaboratively established a nice home.'

(5) a. Dajia fenbie mai-le yidong fangzi gei Laowang.
everybody separately buy-PERF one house to Laowang
'Everybody separately bought a house for Laowang.'
b. Dajia yiqi mai-le yidong fangzi gei Laowang.
everybody together buy-PERF one house to Laowang
'Everyone conjointly bought a house for Laowang.'

In (4a) and (5a), the QAdv's are *dou* 'all' and *fenbie* 'separately', both being distributive. As a result, the universal QP-subjects in these two examples are interpreted distributively. On the other hand, the QAdv's in (4b) and (5b) are *gongtong* 'collaboratively' and *yiqi*

'together', both being collective. The universal QP-subjects in these sentences, therefore, must be interpreted collectively. This is quite unlike the case in English, where QPs such as *everyone* can be inherently distributive or collective. These examples, thus, indicate that the quantificational force of QPs in Chinese and their logical interpretations, in fact, depend crucially on the QAdv's at the sentential level of the phrase structure (Lin 1997).

With this much as the background, we can now move on to a detailed examination of some intriguing phenomena of *Wh*/QP interaction in Chinese. It will be shown that, in addition to the QAdv's, aspects also play an important role in determining the possible readings of the quantificational sentences in Chinese.

2. Three observations concerning the aspectual markers in Chinese

We have seen that the Chinese example in (2a) only permits the two pair-list readings—the list reading and the token reading. It does not permit the individual reading. We shall see, furthermore, that the aspect of the sentence can have a bearing on the availability of these two pair-list readings in quantificational sentences in Chinese. In what follows, we shall present three observations that illustrate this effect.

2.1 Observation 1: Aspectual suffixes and the list reading

Notice that the perfective aspectual suffix *-le* occurs in the Chinese example in (2a). We observe that, if the aspectual suffix *-le* is removed, the sentence can only assume the token reading, and the list reading will become unavailable.

(6) a. Meige ren dou mai-le shenme? *(Token & list readings)*
every person all buy-PERF what
'What did everyone buy?'

b. Meige ren dou mai shenme? *(Token reading only)*
every person all buy what
'What does/did everyone buy?'

c. Meige ren dou {yinggai / bixu} mai shenme? *(Token reading only)*
every person all {should / must} buy what
'What {should / must} everyone buy?'

Example (6a) is a recapitulation of (2a), where the perfective aspectual marker *-le* is suffixed to the verb. As pointed out above, this sentence permits the token and list readings. But once *-le* is removed, as in (6b), the list reading ceases to exist. The only reading that (6b) permits is the token reading, according to which what is being asked is the particular thing that everyone buys/bought a copy or token of. Example (6c) is similar to (6b). In Chinese, when a deontic modal occurs in the sentence, the perfective aspectual marker *-le* cannot occur. We find that in such contexts the list reading is unavailable, as in (6c). Further evidence for this observation comes from epistemic modals such as *yinggai* 'should' and *keneng* 'may', which allow aspectual markers to be suffixed to the main verb of the sentence. When the aspectual suffix *-le* is inserted into the sentence, the list reading resumes:

(7) Meige ren dou { yinggai / keneng } mai-le shenme? *(Token & list readings)*
every person all { should / may } buy-PERF what
'What { should / may } everyone have bought?'

Thus the comparison between (6c) and (7) further confirms the influence of the aspectual suffix to the availability of the list reading.[4]

This observation holds not only for Mandarin Chinese; it is seen in other Chinese dialects as well. For Chinese dialects that did not historically develop a post-verbal suffix system, such as Min or Hakka, the list reading typically is not available for sentences of type (2a). For those Chinese dialects that have a post-verbal suffix system, ambiguity is observed; that is, they permit both the list reading and the token reading.

[4] Though we only use the perfective suffix *-le* in the text to demonstrate the correlation between the presence of the aspectual suffix and the availability of the list reading, this observation appears to hold for other aspectual suffixes as well, like the durative marker *-zhe* and experiential marker *-guo*. The following examples show that, when *-zhe* and *-guo* are suffixed to the verb, the sentences are ambiguous. This parallelism holds for the other observations as well.

(i) a. Meige ren dou chi-zhe shenme? *(Token & list readings)*
every person all eat-DUR what
'What is everyone eating (right now)?'

b. Meige ren dou chi-guo shenme? *(Token & list readings)*
every person all eat-EXP what
'What does everyone have the experience of eating?'

(8) a. Tage lang long be sãhue? *(Taiwanese, token reading)*
all person all buy what
b. T'aika ngin to mai makai? *(Hakka, token reading)*
all person all buy what
c. Mege ngin ze mai-le sa? *(Shanghai, ambiguous)*
every person all buy-PERF what
d. Maikai nang wu mai-la ani muzi? *(Wenzhou, ambiguous)*
every person all buy-PERF what thing
e. Muigo jan dou maai-zo matje? *(Cantonese, ambiguous)*
every person all buy-PERF what

Thus there seems to be a correlation between the availability of the list reading and the presence of the aspectual suffix.

2.2 Observation 2: Aspectual suffixes and situation quantification

Sentences can be situationally quantified. Situation quantification can be either definite/specific or universal/generic. We observe that, if the aspectual suffix occurs in a sentence, the situation quantification must be definite/specific, otherwise the sentence will be unacceptable:

(9) a. Laowang dou qu nali?
Laowang all go where
'Where does Laowang go all the time?'
b. Laowang yiban dou qu nali?
Laowang generally all go where
'Where does Laowang go generally?'
c. Laowang tongchang dou qu nali?
Laowang usually all go where
'Where does Laowang usually go?'

(10) a. Laowang dou qu-le nali?
Laowang all go-PERF where
'Where has Laowang been [in some specific occasions]?'
b.*Laowang yiban dou qu-le nali?
Laowang generally all go-PERF where
'Where has Laowang generally been?'

c.*Laowang tongchang dou qu-le nali?
Laowang usually all go-PERF where
'Where has Laowang usually been?'

d. Laowang zhe-yizhenzi dou qu-le nali?
Laowang this-stretch-of-time all go-PERF where
'Where has Laowang been recently?'

The QAdv *dou* 'all' in Chinese can quantify over situations even when there is no overt situational expression occurring in the same sentence. Numbers (9a) and (10a) exemplify such cases. Notice that in (9a) there is no aspectual marker suffixed to the verb, while in (10a) the perfective marker *-le* is suffixed to the verb. The grammaticality of (9a) and (10a) indicates that situation quantification by *dou* 'all' is not affected by the presence or absence of *-le*. There are, of course, differences in meaning between (9a) and (10a). In (9a), *dou* 'all' quantifies over unspecific, generic situations; in (10a), *dou* 'all' quantifies over a specific set of situations. Now let us turn to the other examples. We find that, when particular situational expressions are inserted into the sentences, the grammatical judgments vary. If a generic situational expression occurs in the sentence, such as *yiban* 'generally' and *tongchang* 'usually', the occurrence of *-le* is fatal. This is illustrated by the contrast between (9b-c) and (10b-c). With *-le*, the situational expression must be definite/specific, such as *zhe-yizhenzi* 'this stretch of time; the recent occasions' in (10d). Thus the presence or absence of the aspectual suffix in a sentence has a direct bearing on the type of situational quantification permitted.

2.3 Observation 3: The aspectual suffixes and numeral objects.

Now we look at sentences where the object is a numeral, rather than a *Wh*-phrase. When the aspectual marker is suffixed to the verb, as in (11a) and (11b), the sentence permits either the list reading, the token reading, or the pure cardinal/focal reading. On the other hand, if the aspectual marker does not occur, the list reading is quite hard to get, as in (11c) and (11d). Instead, these two sentences only permit the token reading and the cardinal/focal reading.

(11) a. Zuotian mei-ge xuesheng dou mai-le liang-ben shu.
yesterday every student all buy-PERF two book
'Every student bought two books yesterday' *or*
'Every student bought two [particular] books yesterday' *or*
'Every student bought two [not one, nor three] books yesterday.'

b. Zuotian mei-ge xuesheng dou keneng mai-le liang-ben shu.
yesterday every student all may buy-PERF two book
'Every student may have bought two books yesterday' *or*
'Every student may have bought two [particular] books yesterday' *or*
'Every student may have bought two [not one, nor three] books yesterday.'

c. Zuotian mei-ge xuesheng dou mai liang-ben shu.
yesterday every student all buy two book
'Every student bought two [particular] books yesterday' *or*
'Every student bought two [not one, nor three] books yesterday.'

d. Zuotian mei-ge xuesheng dou bixu mai liang-ben shu.
yesterday every student all must buy two book
'Every student had to buy two [particular] books yesterday' *or*
'Every student had to buy two [not one, nor three] books yesterday.'

In (11a) and (11b), where the aspect suffix *-le* occurs, the numeral object *liang-ben shu* 'two books' can be understood as denoting two specific books (the token reading), a set of book-pairs (the list reading), or simply two unspecific books (the cardinal/focal reading). Thus it is felicitous to continue the discourse with assertions such as "...which were Aristotle's *On Tragedy* and *On Comedy*" (the token reading), or "John bought *The Unbearable Lightness of Being* and *Life is Elsewhere*, Mary bought *Snow Country* and *Koto*, Bill bought *The Little Prince* and *Flight to Arras*" (the list reading), or "Not one, nor three" (the cardinal/focal reading). However, in (11c) and (11d), where *-le* is removed, the list reading is no longer available. Instead, the sentence must assume the token reading, followed by assertions such as "...which were Aristotle's *On Tragedy* and *On Comedy*" or the cardinal/focal reading, followed by assertions such as "Not one, nor three." These examples, once again, indicate that the presence or absence of the aspectual suffix has a direct bearing on the interpretation of the reading of the quantificational sentences in Chinese.

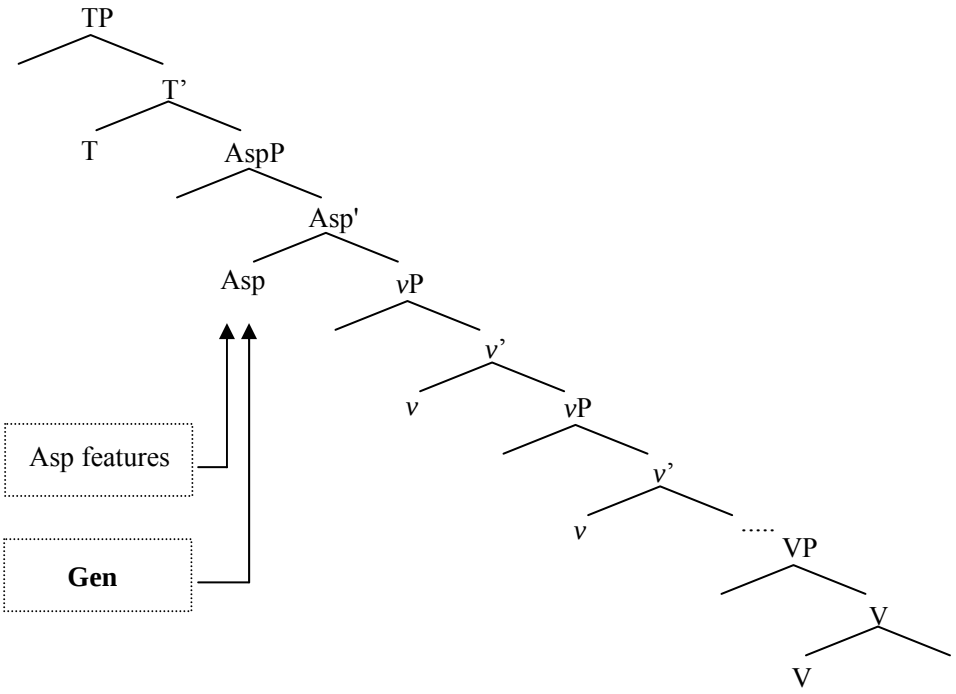
3. Toward an explanation

Though at first sight the three observations may appear to be distinct from one other, we propose that they are actually subject to a unified explanation. Essentially, they have to do with the functional projection AspectP in the syntactic structure of Chinese.

3.1 Phrase structure

To begin with, we assume with Huang (1997) and Lin (2001) that the Chinese sentences are built up via complementation of verbs, light or full. Light verbs are eventuality predicates such as DO, CAUSE, EXIST, and so on; they compose the predicate and introduce arguments into the sentence. We also assume with Lin (2001) that aspectual markers in Chinese are aspectual light verbs, and they occur in a position higher than the subject-selecting light verb. Furthermore, we assume that the functional projection AspP (the aspectual phrase) and TP (the tense phrase) occur in the phrase structure in Chinese (for the functional projection AspP, see Cheng 1991 and Shen 2001; for recent discussions on TP in Chinese, see Tang 1998 and Lin 2001). Look at the following diagram:

(12)



There are two types of elements that can be merged to Asp while the structure is being built: (i) the aspectual features, either for the perfective marker *-le*, the durative marker *-zhe*, or the experiential marker *-guo*; (ii) the generic aspectual operator **Gen**, which is phonetically null. In Syntax, the verb V incorporates to the light verbs *v* (Larson 1988,

Hale and Keyser 1993, Chomsky 1995, Huang 1997, and Lin 2001). We assume that V incorporates to *v* for the purpose of *event identification* (Kratzer 1996). At LF, verbal complex may further move up to Asp. Whether the verbal complex really moves up to Asp, however, depends on the element that has been merged to Asp in Syntax. If it is the aspectual feature that is in Asp, then the verbal complex must move up to Asp in LF so as to check the aspectual feature. Presuming that one of the functions of Asp is to provide an existential closure to the event argument of the predicate, we may reasonably assume that, when the verbal complex is incorporated to Asp in LF, the event argument of the predicate is existentially bound, giving rise to the existential reading of the event. On the other hand, **Gen** can be merged to Asp as well. In that case, the verbal complex *must not* move up to Asp in LF, since there is no feature to check; if the verbal complex moves up to Asp, the derivation will crash. Suppose that in such a situation, the event argument of the predicate is not existentially bound. **Gen** will operate on the event argument in such a way that the event assumes the generic-aspectual reading.

3.2 Types and tokens of event

Here we follow two proposals for the mapping between the event/aspect structure and syntactic structure in Chinese, that is, Kratzer's (1996) proposal of event identification, and Smith's (1994) two-component hypothesis on the aspectual interpretation of Chinese sentences. Kratzer (1996), following Marantz (1984) and Johnson (1991), suggests that the external argument of a sentence is literally "external" in the sense that it is not selected by the verb, but by a functional category Voice. To make sure that the argument selected by V and the argument selected by Voice fall within the same event, an interpretive rule, Event Identification, is postulated ((23), Kratzer 1996:122):

(13) *Event Identification*

f	g	→	h
<e,<s,t>>	<s,t>		<e,<s,t>>
			$\lambda x_e \lambda e_s$ [f(x)(e) & g(e)]

Kratzer (1996) specifically points out that head movement of V to Voice can be regarded as the means to substantiate event identification. Following this proposal, we assume that the movement of V to the light verbs *v* in the phrase structure in (12) is triggered by the need for event identification. After V incorporates to the light verbs *v*, all arguments are tied up to the same event argument. A *type* of event is thus yielded.

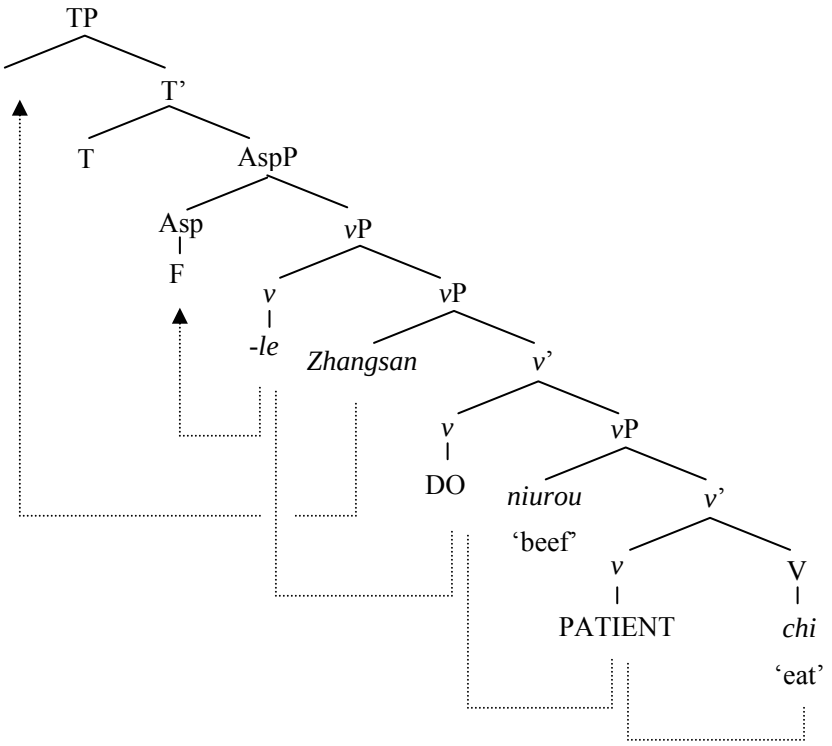
What is a type of event? A type of event is to be contrasted with a *token* of event, a spatio-temporal realization of a type of event. In a nutshell, a type of event is a predicate whose event argument is open and needs be closed off. The closure of the event argument can be achieved by the superimposition of an aspectual interpretation, and this yields a token of event, that is, an event in the real world with certain aspectual interpretation.[5] This distinction is inspired by Smith's (1994) proposal that there are two components in an aspect system, the temporal viewpoint and the type of event. In Chinese, the former is externally superimposed upon the latter. The superimposed temporal viewpoint can be one of several types, represented by the post-verbal aspectual suffix *-guo* (experiential), *-le* (perfective), *-zhe* (durative), and so on. Smith's proposal, applied to the phrase structure in (12), can be understood in the following way. When V reaches the highest *v* (which can be an eventuality predicate or an aspectual light verb; see below), a type of event is yielded. A type of event is an abstract entity that has to be incarnated. The way to incarnation is superimposing a temporal interpretation by the aspect system to the type of event. If Asp hosts the aspectual feature, the verbal complex moves to Asp at LF for checking purposes, and the event argument will be existentially closed. This will yield an existential event. On the other hand, if Asp hosts **Gen**, the verbal complex has to remain *in situ*. The event argument will be closed off *in situ* via functional application with **Gen**, yielding the generic reading. Either way, we obtain a token of the type of event.

Below is a sample derivation that illustrates the proposal sketched above. Suppose we have a sentence as in (14). The semantic derivation for (14) is given in (15).

(14) a. Zhangsan chi-le niurou.
Zhangsan eat-PERF beef
'Zhangsan ate beef.'

[5] Ter Meulen (1995) also makes a similar contrast, following the framework of situation semantics proposed by Barwise and Perry (1983). But ter Meulen (1995) uses the term *situation* rather then *token of event*. A remarkable point in ter Meulen's (1995) proposal is that a situation is a spatio-temporal realization of an event type superimposed with an aspectual interpretation. This point is concordant with the analysis of this work.

b.



(15) a. *chi* 'eat' — λe_s[**eat**(e)]

b. PATIENT — $\lambda y_e \lambda e_s$[**Patient**(e,y)]

c. *chi* 'eat' — $\lambda y_e \lambda e_s$[**eat**(e)$\wedge$**Patient**(e,y)] *(Event Identification, (a) & (b))*

d. *chi niurou* 'eat beef' — λe_s[**eat**(e)$\wedge$**Patient**(e,**beef**)] *(Lambda conversion)*

e. DO — $\lambda x_e \lambda e_s$[**Agent**(e,x)]

f. *chi niurou* 'eat beef' — $\lambda x_e \lambda e_s$[**eat**(e)$\wedge$**Patient**(e,**beef**)$\wedge$**Agent**(e,x)] *(Event Identification, (d) & (e))*

g. *ZS chi niurou* 'ZS eat beef' — λe_s[**eat**(e)$\wedge$**Patient**(e,**beef**)$\wedge$**Agent**(e,**ZS**)] *(Lambda conversion)*

h. *-le* — $\lambda t_i \lambda e_s$[$\mathbf{F}_{\textit{-le}}$(t,e)]

i.	*ZS chi-le niurou* 'ZS ate beef'	$\lambda t_i \lambda e_s$[**eat**(e)$\wedge$**Patient**(e,**beef**)$\wedge$**Agent**(e,**ZS**)$\wedge$ $\mathbf{F}_{\text{-}le}$(t,e)] *(Event Identification, (g) & (h))*
j.	$F_{\text{-}le}$	$\lambda t_i \exists e_s$[$\mathbf{F}_{\text{-}le}$(t,e)]
k.	Rule of Event Closure	<i,t>+<i,<s,t>>$\rightarrow$<i,t> Condition: **F** must match.
l.	*ZS chi-le niurou* 'ZS ate beef'	$\lambda t_i \exists e_s$[**eat**(e)$\wedge$**Patient**(e,**beef**)$\wedge$**Agent**(e,**ZS**)$\wedge$ $\mathbf{F}_{\text{-}le}$(t,e)] *(Event Closure, (i) & (j))*
m.	T	Speech time = **ST**
n.	*ZS chi-le niurou* 'ZS ate beef'	$\exists e_s$[**eat**(e)$\wedge$**Patient**(e,**beef**)$\wedge$**Agent**(e,**ZS**)$\wedge$ $\mathbf{F}_{\text{-}le}$(**ST**,e)] *(Lambda conversion)*

Now let us take a closer look at the derivation in (15). The verb *chi* 'eat' starts out as a predicate with only one argument, namely, the event argument. As the derivation proceeds, it acquires the predicates PATIENT and DO as well as the internal argument *niurou* 'beef' and the external argument *Zhangsan*, via event identification and lambda conversion. At the point that the resulting verbal complex is incorporated with the perfective marker *-le*, a special application of Event Identification yields a predicate of the type <i,<s,t>>, as in line (i). This would not be an awkward operation, since all that we need to do is to loosen the rule of Event Identification in such a way that it does not takes <e,<s,t>> as the only input type (see *g* in (13)), but <i,<s,t>> as well. In line (j) we propose that the aspectual feature F is a function of the type <i,t>, and the predicate $\mathbf{F}_{\text{-}le}$ contained in it (also in the function of *-le* in line (h)) stands for whatever semantic component is attributed to the perfective aspect.[6] $\mathbf{F}_{\text{-}le}$ is a predicate of time instances/ intervals because it has to be fixed to a reference time. In line (k), we postulate an interpretive rule, the rule of Event Closure, which performs the following procedures. First, it identifies the time argument *t* of two predicates of time;[7] second, it existentially closes the event argument *e* in one of the input predicates; third, it yields a predicate of time out of a predicate of time and a predicate of time and event. There is a condition that must be met for the application of Event Closure, though—the two input predicates must match in the aspectual predicate **F**. Failing to meet this condition will lead to crash of derivation and the semantics of the sentence will be undefined. After the

[6] For a detailed discussion of the semantic function of *-le*, see J. Lin (2000).

[7] We follow the spirit of Kratzer's (1996) proposal and assume that head movement must involve identification of predication of some sort. In the present case, it is the predication of the time argument that is identified.

application of Event Closure, the head T provides a value of time, which closes the time argument *t*. In this way, the semantics of the sentence in (14) is successfully derived.

Notice that the derivation of (14) depends crucially on the application of Event Closure, and the application of Event Closure in turn depends on the matching of **F**. If the operator **Gen** is merged to Asp instead of **F**-*le*, the derivation will crash. We propose that **Gen** has the function shown in (16a). For **Gen** to work properly, the semantic representation of the predicate must be something like (16b) when the derivation reaches the highest *v*P. Functional application then yields the semantic representation in (16c).

(16) a. **Gen** $\lambda P_{<s,t>}\lambda t_i$**Gen**$e_s[P(e)]$

b. *ZS chi niurou* $\lambda e_s[$**eat**$(e)\wedge$**Patient**$(e,$**beef**$)\wedge$**Agent**$(e,$**ZS**$)]$
'ZS eat beef'

c. *ZS chi niurou* λt_i**Gen**$e_s[$**eat**$(e)\wedge$**Patient**$(e,$**beef**$)\wedge$**Agent**$(e,$**ZS**$)]$
'ZS eat beef'

In the case where the aspectual marker *-le* occurs, **Gen** will not be able to function properly. This is so because *v*P will be of the type <i,<s,t>>, which will result in type mismatch with the type <<s,t>,<i,t>> of **Gen**. Event Closure cannot apply to save the derivation, since **F** is not contained in the function of **Gen**, and hence the condition for Event Closure will fail to be met.[8]

[8] In addition to those overt aspectual markers, it seems that the aspect of a Chinese sentence can be "anaphoric" to the aspect in the preceding sentence. (The "anaphoric" aspect that we are referring to here is very similar to what Smith (1994) calls the "neutral viewpoint" of aspect in Chinese. See Smith (1994) for details.) Look at the following examples:

(i) a. Menkou zhan-zhe yige chuan hei yifu,
door stand-DUR one wear black cloth
dai hei yanjing de ren.
wear black glasses MOD person
'At the door stood a person in black clothing with black glasses.'

b. Zuo-wan Laowang qing-le shei lai jia-li chifan?
last-night Laowang invite-PERF who come home dine
Ta qing Laozhang.
he invite Laozhang
'Who did Laowang invite home for dining? He invited Laozhang.'

In (ia-b), the predicates 'wear black cloth', 'wear black glasses', and 'invite Laozhang' do not take overt aspectual markers. However, these predicates do assume specific aspectual interpretations. In (ia), the most natural reading for the predicates 'wear black cloth' and 'wear black glasses' is one with the durative aspect (that is, the aspect *-zhe*), and in (ib) the verb *qing* 'invite' in the second clause can be understood as assuming the perfective aspect (that is, the

3.3 The account for the three observations

With all this in mind, we are now ready to provide a unified account for the three observations presented earlier. The crucial assumption in the account is: *the list reading is correlated with the existentiality of the event, and hence bears directly on the head movement of the V-*v *complex to Asp.* The validity of this assumption will be justified later.

The first observation was that, the list reading is possible for sentences of (2a) type only when the verb takes an aspectual suffix. This is so because the presence of the aspectual suffix entails head incorporation of the verbal complex to Asp. The aspectual feature is checked, and the event argument is existentially closed. In the case where the aspectual suffix does not occur, **Gen** is in Asp, blocking head movement to Asp. As a result, the event argument is not existentially closed, and hence the list reading is not possible.

The second observation was, the presence or absence of the aspectual marker in the sentence is correlated with the type of situation quantification permitted. When the aspectual marker occurs, the situation quantified over must be definite or specific; when the aspectual marker does not occur, the situation has to be generic. We assume that the situational adverbials such as *yiban* 'generally', *tongchang* 'usually', *zhe-yizhenzi* 'recently' and so on are adjoined to Asp' licensed by the head Asp. Since the presence of the aspectual marker entails existentiality of the event, the situational adverbials that occur must denote existent occasions, and therefore must be definite or specific. On the other hand, when the aspectual marker does not occur, **Gen** is in Asp. The situational adverbials thus have to be generic so as to be semantically compatible with the licenser.

The third observation was, for sentences with numeral objects, the list reading is possible only when the verb takes an aspectual suffix; otherwise the numeral objects have to assume the token reading or the cardinal/focal reading. Just like the above, the presence of the aspectual marker entails incorporation of the verbal complex to Asp. The list reading thus ensues. On the other hand, the absence of the aspectual marker entails that **Gen** is in Asp. Since the generic reading typically involves abstracting common properties out of a class of similar events, it is expected that only the token reading or the cardinal/focal reading is possible.[9]

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aspect of *-le*). Apparently these two specific aspectual readings are carried over from the preceding aspects, *-zhe* and *-le* respectively. We can assume that, in these predicates, the functional head Asp hosts an empty operator Op, which is anaphoric to the preceding aspect. Due to limitation on scope, we shall not go into detailed discussions of this aspect and Op.

[9] Which reading is taken up depends on the domain of abstraction, the numeral only or the whole nominal. Highlighting common attributes also gives rise to focus effects.

3.4 Existentiality of event and the list reading

Earlier we assumed that the list reading is possible only when the event is existential. This is not an arbitrary assumption. A support for this assumption comes from the QAdv *ge* 'each' in Chinese. Compare the following two sentences:

(17) a. Meige ren dou mai-le shenme? *(Token & list reading)*
every person all buy-PERF what
'What did everyone buy?'
b. Meige ren ge mai-le shenme? *(List reading only)*
every person each buy-PERF what
'What did each one buy?'

We know that (17a) is ambiguous—it can assume the token reading or the list reading. But in (17b), where *dou* is replaced by *ge*, the token reading disappears, and the only reading available is the list reading. In Lin (1998) it is found that the QAdv *ge* requires that the event denoted by the predicate in which it occurs be existential. The fact that (17b) only permits the list reading, therefore, indicates that the existentiality of event plays an essential role in sanctioning the list reading of a sentence.

Further support comes from the following observation. If *ge* requires that the event be existential, then we predict that the occurrence of *ge* will be unacceptable in sentences where the aspect is generic (that is, where Asp hosts **Gen**). This prediction is borne out, as the following examples show.

(18) a. (Zuotian laoban hezhun caigou zhi-hou,)
yesterday boss approve purchase after
tamen ge mai-le shenme?
they each buy-PERF what
'What did each of them buy (after the boss approved the purchases yesterday)?'
b. (Zuotian laoban hezhun caigou zhi-hou,)
yesterday boss approve purchase after
tamen keneng ge mai-le shenme?
they may each buy-PERF what
'What may each of them have bought (after the boss approved the purchases yesterday)?'

(19) a. (Mei-ci laoban hezhun caigou zhi-hou,)
every-time boss approve purchase after
?*tamen ge mai shenme?
they each buy what
'What did each of them buy (after the boss approved the purchases each time)?'

b. (Mei-ci laoban hezhun caigou zhi-hou,)
every-time boss approve purchase after
?*tamen bixu ge mai shenme?
they must each buy what
'What must each of them buy (after the boss approved the purchases each time)?'

c. (Mei-ci laoban hezhun caigou zhi-hou,)
every-time boss approve purchase after
?*tamen tongchang ge mai shenme?
they usually each buy what
'What did each of them usually buy?'

In (18a-b), the context (the expression enclosed in the brackets) demands that the sentence in which *ge* occurs be a proposition denoting an existential event. For this, the main verb is suffixed with the perfective aspectual marker *-le*. These sentences are perfectly acceptable. In (19a-c), on the other hand, the context (the expression in the brackets) enforces a habitual or generic interpretation of the sentence in which *ge* occurs, thus the sentence must be of generic aspect. We find that the sentences are significantly degraded. The degradation of (19a-c) is predicted: in these sentences, the operator **Gen** is merged to Asp, and the merger of **Gen** prevents the event argument from being existentially closed, which leads to unacceptability of the sentences.[10]

[10] An inference one could make based on the earlier discussion is that, as long as the presence of aspectual markers entails existentiality of the event, the occurrence of *ge* in a sentence must be sanctioned by the appearance of an aspectual marker. However, an anonymous reviewer correctly points out that the acceptability of *ge* in a sentence does not necessarily bear on the presence or absence of the aspectual marker in the sentence. Consider the following example (suggested by the reviewer):

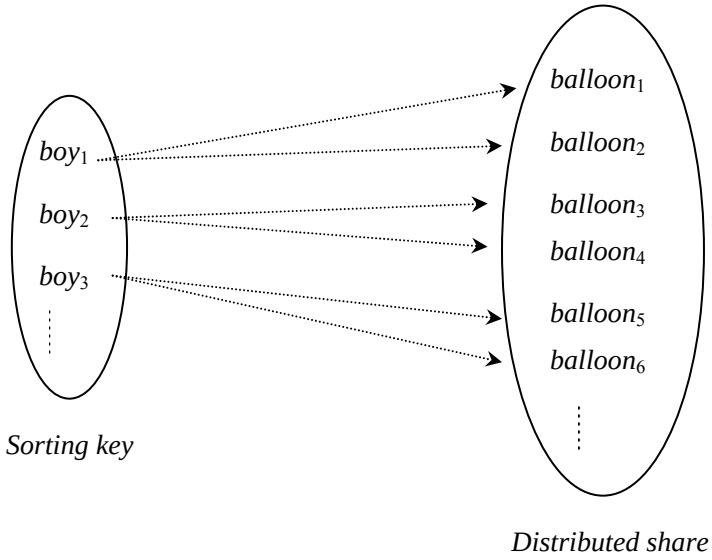
(i) a. Nimen ge xuan liang-men ke jiu keyi le.
you each take two-CL course then fine PRT
'It would be fine for each of you to take two courses.'

b. Mingtian laoban hezhun yihou, nimen ge xiang mai shenme?

As this point we must answer an important question: Why is the list reading correlated with the existentiality of event? The answer to this question actually follows directly from the nature of the list reading. The list reading, in fact, is an instance of *distributivity*. According to Choe (1987), there are two essential components in a distributive relation, the *distributed share* and the *sorting key*. Taking (20a) as an example, the distributed share is the set of pairs of balloons, and the sorting key is the set of boys. The distributive relation involved can be visualized in the diagram in (20b).

(20) a. The boys bought two balloons each.

b.



A crucial point here is that, for a distributive relation to hold, the set of the sorting key and the set of the distributed share must be properly defined. Existentiality appears to be an indispensable part in the proper definition of the two sets.[11] To strengthen this claim, consider the following two examples:

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tomorrow boss approve after you each want buy what
'What do each of you plan to buy after the boss approves it tomorrow?'

But notice that there is a crucial difference between (ia-b) and (19a-c); that is, (19a-c) assumes the generic aspect, whereas (ia-b) are still existential—(ia) means that it would be fine for an episodic event (taking two courses only) to become true, and (ib) is a question about an episodic event expected to become true tomorrow tomorrow. Since (1a-b) both involve episodicity, existentiality must be involved too. Thus (ia-b) does not pose problems for the argument based on (18-19).

[11] This claim is supported by Fraenkel's axiom of substitution scheme in a Zermelo-Fraenkel set-theoretical model of semantics, given below (adapted from Landman 1990:51):

(21) a. *The average boys bought two balloons each.
b. *The boys bought two average balloons each.

Numbers (21a-b) are both ungrammatical. To retrieve the ungrammaticality, it should be pointed out that the nominals *average boys* and *average balloons* are not referential expressions. They are generic expressions and hence do not feed distributive relation. In other words, (21a) is ungrammatical because the sorting key cannot be existentially defined, and, likewise, (21b) is ungrammatical because the distributed share is not existentially defined. (Namely, it is not possible to come up with an existent set of boys, nor an existent set of balloons, which the distributive relation triggered by *each* can be based on.) It thus appears that the existentiality of the sorting key and the distributed share is the foundation for a legitimate distributive relation.[12]

3.5 Distributivity operators

To strengthen the assumption that distributivity is correlated with existentiality of event, let us take a closer look at the key elements, the QAdv's *dou* and *ge*. These two elements have been subject to intensive discussion with respect to their distributive force, in works such as J. Lin (1996), Li (1997), Lin (1998), to name but a few. In the following we shall examine the functions of these two elements and see how their distributive force is correlated with the existential quantification of the event argument.

First we look at *ge*. Lin (1998) puts forth an in-depth study of *ge* and finds that *ge* is a VP-level element. Suppose that *ge* is adjoined to the highest *v*P. Its function can be

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(i) Given set A [= domain of a function *f*] and formula φ:
$\forall x \exists y \varphi \rightarrow \exists B \forall y[y \in B \leftrightarrow \exists x[x \in A \wedge \varphi]]$

The axiom in (i) has the effect to guarantee that, for a function to be properly defined, as long as a domain (= the sorting key in a distributive relation) exists, a range (= the distributed share in a distributive relation) exists. Though this axiom is quite different from the formulations of the functions of distributivity for *dou* and *ge* to be given later, it is clear that an appropriate semantic characterization of distributivity must presuppose (i) in one way or another.

[12] Notice that (21a-b) will become significantly better if *each* is deleted from the sentences:

(i) a. (In the 70's,) the average boys bought two balloons (when they take girlfriends out).
b. (In the 70's,) the boys bought two average balloons (among other typical kinds of things).

While (ia-b) may still be awkward to some extent, they sound much better than (21a-b). This can be regarded as a piece of evidence that the ungrammaticality of (21a-b) rests crucially on the element *each* and the distributive relation it triggers.

represented as below. (The symbol ≤ stands for the relation 'is a part of'. We follow Lasersohn (1995) and assume that distributivity involves part-whole relations of events.)

(22) *ge* $\lambda P_{<i,<s,t>>}\lambda e'_s[\forall x_j(x_j \leq x_i \rightarrow \exists e\ (e \leq e' \wedge P(e)))$

Number (23) is a sentence with *ge* quantification; (24) is a partial semantic derivation for (23).

(23) Tamen ge mai-le yi-ben shu.
they each buy-PERF one book
'They bought a book each.'

(24) a. *mai* $\lambda e_s[\mathbf{buy}(e)]$
'buy'

b. *mai yi-ben shu* $\lambda e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{1\text{-}book})]$
'buy a book'

c. $\mathbf{x_i}$ *mai yi-ben shu* $\lambda e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{1\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i})]$
'$\mathbf{x_i}$ buy a book'

d. $\mathbf{x_i}$ *mai-le yi-ben shu* $\lambda t_i\lambda e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{1\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i}) \wedge \mathbf{F}_{\text{-}le}(t,e)]$
'$\mathbf{x_i}$ bought a book'

e. *ge* $\lambda P_{<i,<s,t>>}\lambda e'_s[\forall x_j(x_j \leq x_i \rightarrow \exists e\ (e \leq e' \wedge P(e)))]$
'each'

f. *ge* $\mathbf{x_i}$ *mai-le yi-ben shu* $\lambda t_i\lambda e'_s[\forall x_j(x_j \leq x_i \rightarrow \exists e\ (e \leq e' \wedge (\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{1\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i}) \wedge \mathbf{F}_{\text{-}le}(t,e)))]$
'$\mathbf{x_i}$ each bought a book' '$\mathbf{x_i}$ bought a book each'

In the derivation, the verb *mai* 'buy' starts out selecting one argument, the event argument. Through the applications of event identification, it acquires the predicate of agent and the predicate of patient, as well as the arguments of agent and patient. A special point in the derivation is that, in line (c), a free variable $\mathbf{x_i}$ is introduced. (It also occurs in the semantic representation of *ge* in (22).) This free variable is intended to stand for the trace of the external argument, namely the agent, which has moved to TP Spec. This practice is adopted from J. Lin's (1996) analysis of *dou*, to which we shall turn later. According to J. Lin (1996), INFL (or T in the present framework) will provide a lambda operator to close $\mathbf{x_i}$, so there will not be interpretive problems with it.

After *ge* is combined with the predicate, a function from time to event to truth value is yielded; see line (f). The next step is the incorporation of the verbal complex to Asp, so that the event argument can be existentially closed. Notice that this is an essential step. The function of *ge* in line (e) contains an existentially quantified event argument,

e, which, on the one hand, is a part of the event argument *e'*, and, on the other, holds a one-to-one relation with the parts x_j of the universally quantified subject $\mathbf{x_i}$. If *e'* is existentially closed, no problem arises. However, if e' is closed by the operator **Gen**, it is not clear what $\mathbf{x_i}$ and the universal quantification over $\mathbf{x_i}$ would denote. The situation would be like the following unacceptable sentences:

(25) a. *Yiban-de ren ge chi liang-ge ji-dan.
general-Mod person each eat two egg
'*The average people eat two eggs each.'
b. *Laowang yiban-de rizi ge chi liang-ge ji-dan.
Laowang general-Mod day each eat two egg
'*Laowang eats two eggs each in the average day.'

Since the domain of quantification cannot be properly defined, the sentences in (25a-b) are unacceptable. (See the discussion surrounding (21a-b).) All this then indicates that existentiality of the event is essential to a distributive relation.

Next we turn to *dou*. J. Lin (1996) proposes that *dou* has the following semantic function (with minor adjustments in format by the author; see J. Lin (1996:23) for the original format):

(26) *dou* $\lambda P_{<e,t>} \forall x_j [x_j \in \mathbf{x_i} \rightarrow P(x_j)]$

Lin (1998) shows that the structural position of *dou* in Chinese sentences is quite flexible; it can be as high as preceding the modal, and it can also be as low as occurring internal to the predicate (such as appearing after the post-*ba* nominal in the *ba* construction). Thus the identity of P as of the type <e,t> in (26) may not be completely accurate. This question does not concern us here, however. What does concern us is how the distributive relation is correlated with existentiality of event in the case of *dou* quantification. In the following we shall look at two examples and illustrate such correlation.

First we look at the case where the aspectual marker *-le* is suffixed to the verb. For simplification, let us assume that *dou* is adjoined to AspP.

(27) Tamen dou mai-le liang-ben shu.
they all buy-PERF two book
'They all bought two books.'

(28) a. $\mathbf{x_i}$ *mai liang-ben shu* — $\lambda t_i \lambda e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i})]$
'$\mathbf{x_i}$ buy two books'

b. $\mathbf{x_i}$ *mai-le liang-ben shu* — $\lambda t_i \exists e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e, \mathbf{x_i}) \wedge \mathbf{F}_{\text{-}le}(t,e)]$
'$\mathbf{x_i}$ bought two books'

c. *dou* — $\lambda P_{<i,t>} \forall x_j [x_j \in \mathbf{x_i} \rightarrow P(x_j)]$
'all'

d. *dou* $\mathbf{x_i}$ *mai-le liang-ben shu* — $\lambda t_i \exists e_s \forall x_j [x_j \in \mathbf{x_i} \rightarrow (\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e, x_j) \wedge \mathbf{F}_{\text{-}le}(t,e))]$
'all $\mathbf{x_i}$ bought two books'

In the derivation in (28), the predicate (*v*P) combines with Asp, resulting in a predicate of the type <i,t>. Then *dou* joins the play. Here we reïdentify *dou* as the type <<i,t>,<i,t>>. Through functional application *dou* and the aspectual phrase combine to yield a predicate of the type <i,t>. Throughout the derivation *dou* does not affect the quantificational properties of the event argument *e*. Since *e* is existentially closed (by Asp, independently), it is easy to define the domain that *dou* quantifies over, namely $\mathbf{x_i}$ and x_j: the domain that *dou* quantifies over is simply the set ($\mathbf{x_i}$) of individuals (x_j) that assume the role of agent in the token of event *e* located in certain spatio-temporal setting. Thus the sorting key and the distributed share can both be properly defined, giving rise to a legitimate distributive relation.

Next we turn to the case where no aspectual marker occurs. An example is given in (31), with the semantic derivation in (32):

(29) Tamen dou mai liang-ben shu.
they all buy two book
'They all bought two books.'

(30) a. $\mathbf{x_i}$ *mai liang-ben shu* — $\lambda t_i \lambda e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i})]$
'$\mathbf{x_i}$ buy two books'

b. **Gen** — $\lambda P_{<s,t>} \lambda t_i \mathbf{Gen} e_s[P(e)]$

c. **Gen** $\mathbf{x_i}$ *mai liang-ben shu* — $\lambda t_i \mathbf{Gen} e_s[\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e,\mathbf{x_i})]$
'**Gen** $\mathbf{x_i}$ buy two books'

d. *dou* $\mathbf{x_i}$ *mai liang-ben shu* — $\lambda t_i \mathbf{Gen} e_s \forall x_j [x_j \in \mathbf{x_i} \rightarrow (\mathbf{buy}(e) \wedge \mathbf{Patient}(e,\mathbf{2\text{-}book}) \wedge \mathbf{Agent}(e, x_j))]$
'all $\mathbf{x_i}$ buy two books'

In (30), the predicate (*v*P) does not contain any aspectual information; as a result, it has to combine with the generic aspect **Gen**. The operator **Gen** closes the event argument *e*.

Dou then operates on the aspectual phrase, yielding a predicate of time. A function of **Gen**, among others, is to promote an individual to a *kind*, as originally proposed by Carlson (1977). Thus the predicate 'buy two books' in (29-30) in fact does not denote any particular action of two-book-buying; it is the name of the kind of action 'two-book-buying'. The name of a kind is not really referential; for example, there is a kind of animal *dragon*, which does not correspond to any group of animals that exist or existed. Since the predicate 'buy two books' denotes a kind of action, there is no guarantee that a set of pairs of books really exists; as a result the distributed share cannot be properly defined. This is the reason that (29) does not permit the list reading. In this case, again, *dou* does not affect the aspect of the predicate. It simply contributes to the mapping from a set of individuals to truth values (provided that λt in all these examples has been successfully closed). In view of the semantic derivations in (28) and (30), *dou* actually is not like a genuine distributivity operator such as *ge*, as it does not really pair up a set of sorting key and a set of distributed share. It is simply a universal quantifier in all these cases.

4. Summary

In this work we examined a number of questions related to *Wh*/QP interaction in Chinese. First of all we indicated that the *Wh*-phrase and the QP-subject in sentences of (2a) type do not really interact like their English counterparts. Next we discerned two possible readings for (2a) type of sentences, the token reading and the list reading, and showed that the aspect of a sentence has a direct bearing on the available readings. To provide a unified explanation, we proposed that the list reading is in fact an instance of distributivity, and that a distributive relation has to be licensed by an existential event. At the end of the work we looked at two specific distributive operators, *ge* and *dou*. We showed that, for *ge* quantification and *dou* quantification to instantiate distributive relations, it is essential for the event argument to be existentially closed. This grants further support to the correlation between distributivity and existentiality of event.

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動貌對漢語疑問詞組與量化詞組互動中分列性語意之影響

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本文所考察的問題，乃是漢語中疑問詞組與量化詞組互動的現象。雖然之前的學者曾提出漢語中疑問詞組與量化詞組的互動會導致邏輯歧義，本文認爲漢語和英語的情形仍呈現出非常基本的差異。具體而言，漢語的情形中，動貌扮演著極重要的角色。本文援引了三個現象來支持此一論點。(一) 句子的動貌決定賓語是否容許分列性的詮釋；(二) 句子的動貌與句中的情狀量化現象有直接的關係；(三) 句子的動貌對數量賓語的語意詮釋有直接的影響。本文提出，以上三個現象，若將事象結構分爲事象類型及具體事象兩個層面來看，當可獲得完整的解釋。事象類型爲一開放事象結構，須受到動貌的詮釋方能成爲具體事象。漢語語法所提供的動貌詮釋有兩種：存在性動貌及普遍性動貌。本文指出，以上所援引之三個現象皆爲動貌詮釋之不同所引起。這種看法也解釋了漢語和英語在疑問詞組與量化詞組互動方面的差異：漢語語句的歧義其實並非邏輯歧義，而是兩種不同的動貌詮釋所產生的兩種語意。

關鍵詞：疑問詞組與量化詞組互動，動詞移動，動貌，分列性