The Syntax and the Semantics of Collective Marker *yibing* in Mandarin Event Structure

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【摘要】

本文旨在探討漢語中集體標記詞（Collective marker）「一併」的句法結構及語義分析，並分析「一併」在句子事件結構（Event structure）上的影響。首先，在語義學上，本文主張「一併」是一個客體導向（theme-oriented）的標記詞其具有向左量化（Left-quantified）及向右量化（Right-quantified）的特性，這推翻了以往學者認為「一併」只具有向左量化的特性；再者，在與事件結構中，「一併」所修飾的事件客體（modifiee） 必需具有改變狀態（change of state）的語義特徵，同時並具有群組參照（group ref.）及承事者（affectee）的特徵。而在句法結構上，本文提出「一併」具有無法詮釋的特徵（uninterpretable feature），因其所在句子中的群組數量詞組（GQP:Group-denoting quantified phrasae）必須具有承事者「+affectee」的特徵，而這個特徵對於「一併」而言是個無法詮釋的特徵（uninterpretable feature），這點我們透過句法方式，認為在邏輯形式（LF）前「一併」必需與其修飾的群組數詞組進行特徵印證（feature checking），使得「一併」無法詮釋的特徵得以在語義詮釋前刪除（feature deletion），否則句子將不合法

【關鍵詞】

漢語，事件結構，數量詞組，特徵驗證

【Abstract】

The Mandarin adverb *yibing* is usually translated into “together” in English. English *together* can occur both in the adverbial position or adnominal position. Mandarin *yibing*; however, can only occur in adverbial position. This paper aims to deal with the Mandarin collective marker *yibing* and its interaction with event structure from semantics and syntactic perspectives. In semantics, *yibing* can be

treated as a theme-oriented collective marker and requires its argument to have the property of INT-WH (integrated whole). *Yibing* can not only be a left-quantified marker but also can be a right-quantified marker. Meanwhile, the *yibing*'s modifiee should have the event features of change of state and affectee. Syntactically, this article proposes that affectee is an uninterpretable feature for *yibing*. It has to undergo feature check with GQP. According to Beghelli and Stowell (1997), the GQPs (Group-denoting Quantified Phrases) need to check their group reference with an existential operator-head (∃). Herewith, we follow Beghelli and Stowell to assume that GQP is endowed with an extra feature that marks it as the logical subject of predication, and it will be driven to move up to Spec of RefP; otherwise it will remain in ShareP. The GQP in a *yibing* occurred sentence should have not only [+group ref.] but also [+affectee]. By LF, *yibing* has to make feature check with GQP and then delete uninterpretable affectee feature for full interpretation.

【Keywords】

Mandarin, Event Structure, GQPs, Feature Checking

1. Introduction

The Mandarin adverb *yibing* is usually translated into "together" in English. English *together* can occur both in the adverbial position and adnominal position. The adnominal 'together' is analyzed as an antidistributivity marker (Hoeksema 1983, Schwarzschild 1992, 1994), or a group measure function in terms of weight or income (Moltmann 2004). On the other hand, the adverbial *together* is analyzed as specifying collective actions, coordinated actions, spatiotemporal proximity, or temporal proximity (c.f Kuo 2007)

(1) a. John and Mary together weigh 200 pounds.
b. John and Mary together earned 1000 dollars.

(2) a. John and Mary lifted the piano together.
b. John and Mary thought together about the problem.

c. John and Mary sat on the bench together.

d. John and Mary took the exam together.

Mandarin *yibing,* however, can only occur in adverbial position, such as in (3).

(3) a. Zhangsan yibing jiao-le shui fei han dian fei
Zhangsan together pay-ASP water rate and power rate
'Zhangsan pay the water fee and power rate together.'

b.* Zhangsa jiao-le yibing shui fei han dian fei.
Zhangsan pay-ASP together water rate and power rate
'Zhangsan pay together the water rate and power rate.'

Kuo (2007) treat *yibing* as a theme-oriented collective and left-quantified marker. He illustrates his proposal with the following sentences in (4).

(4) a.* Lao Wang han Lao Li yibing zhuchi huiyi
Lao Wang and Lao Li together moderate meeting.
'Lao Wang and Lao Li moderate the meeting together.'

b.* Lao Wang yibing zhuchi huiyi
Lao Wang together moderate meeting
'Lao Wang moderates the meeting together.'

c.* Na yi- jian shi, Lao Wang yibing chuli.
That one-CL matter Lao Wang together manage
'That one thing, Lao Wang manages together.'

d. Na laing-jian shi, Lao Wang yibing chuli.
That two-CL matter Lao Wang together manage
'Lao Wang manages that two things together.'

e.* Lao Wang yibing chuli na liang-jian shi.
Lao Wang together manage that two-CL matter
'Lao Wang manages those two things together.'

We agree with Kuo on that *yibing* is a theme-oriented collective marker. However, we argue against that *yibing* is a left-quantified marker. *Yibing* can right-quantify the QNP, such as the sentences in (5).

(5) a. Yuehan gonggao mingtian jiang yibing tiaozhang bi gen zhi jiage
Yuehan announce tomorrow will together increase pen and paper price
'John announce that pen and paper price will be increased together tomorrow.'

b. Xiao Mei yibing fu-le shui fei gen dian fei
Xiao Mei together pay-ASP water bill and power bill
'Xiao Mei paid water bill and power bill together'

Obviously, *yibing* in sentences (5a) and (5b) right-quantify the theme *bi gen zhi jiage* and *shui fei gen dian fei*, respectively.

In addition to requiring its modifiee to be integrated into a whole, *yibing* requires its modifiee to be an affectee. The situation can be illustrated with the sentences in (6).

(6) a.* Xiao Mei han Xiao Hua yibing xizao
Xiao Mei and Xiao Hua together take a bath
'Xiao Mei and Xia Hua take a bath together.'

b. Mama yibing bang Xiao Mei han Xiao Hua xizao.
Mother together help Xiao Mei and Xiao Hua take a bath.
'Mother wash Xiao Mei and Xiao Hua together.'

Sentence (6a) is ungrammatical to most of native speakers, but the native speakers accept (6b) as a grammatical sentence. To look into the reason, we find that *Xiaomei han Xiaohua* in sentence (6a) are agent, but they are affectee in sentence (6b). Therefore, *yibing* is not only a theme-oriented collective marker, but also an affectee modifier.

There are two purposes in this paper. One is to discuss the semantic interpretation of collective marker *yibing* in Mandarin Chinese. This article finds

that *yibing* is not only a theme-oriented collective marker, but also requires its argument to have the property INT-WH. Meanwhile, the *yibing*'s modifiee has the feature of change of state, such as (5). The other one is to discuss *yibing*'s syntactic features. This article proposes that GQP modified by *yibing* has two syntactic features: [+affectee] feature and [+group ref.] feature. According to Beghelli and Stowell (1997), the GQPs need to check their group reference with an existential operator-head (∃). Herewith, we follow Beghelli and Stowell to assume that GQP is endowed with an extra feature that marks it as the logical subject of predication, it will be driven to move up to Spec of RefP; otherwise it will remain in ShareP. On the other hand, *yibing* has one uninterpretable syntactic feature [affectee]. For full interpretation in semantics, *yibing* has to make feature check with GQP. If the uninterpretable feature cannot be checked by LF, the sentence will be ungrammatical.

2. English '*together*'

Moltmann (1994, 1998) suggests that *together* is a part-structure modifier which requires its arguments to become an integrated whole in possible dimensions relevant in situations. The examples (7)-(10) illustrate how the integrated whole which *together* requires are formed.

(7) The boys lifted the piano together. (the group-action reading)

(8) Alice and Lily talked about the cosmetics together. (the coordinated-action reading[1])

(9) Bill and Jane sat on the sofa together. (the spatio proximity reading)

(10) John and Mary had interviews together. (the temporal proximity reading)

[1] The coordinated-action used in Moltamnn (1997) and the cooperative-action used in Lasersohn (1990) are identical except for the naming.

Sentences in (7)-(10) represent various reading of *together*, namely the group-action reading, the coordinated-action reading, the spatio proximity reading and the temporal proximity reading. Within Moltamnn's theory, in (7), the sum of *the boys* becomes an integrated whole and further induces the group-action reading. In (8), the subevent whose agent is *Alice* and the other subevent whose agent is *Lily* compose an integrated event which is another kind of the integrity. Such kind of integrity motivates the coordinated-action reading. In (9), the location of *Bill'*s sitting and *Jane*'s sitting form an integrated whole which leads to the spatio proximity reading. In (10), time of the events composed of *John*'s interviewing and *Mary*'s interviewing form an integrated whole and then the temporal proximity reading is derived.

Thus far, Moltamnn's theory not only explains the collective reading induced by *together*, but also illustrates the proximity uses of *together* with a unified account. Nevertheless, even though such flexible explanation takes great advantage in describing the semantic meaning of the adverbial *together*, it still fails to explain the adnominal *together.* Consider examples (11)-(14) with the adnominal *together* shown in the following:

(11)* John and Mary together weigh.

(12) John and Mary together weigh 200 pounds.

(13)* John and Mary together are paid monthly.

(14) John and Mary together are paid 1,000 dollars monthly.

Obviously, examples (11) and (13) are ungrammatical. Note that when measure phrases are added in, those ungrammatical examples become acceptable as illustrated in (12) and (14). Given examples (11)-(14), Moltman discards her previous theory and gives a new measurement-based analysis to explain the adnominal *togehter*. In his new analysis, (12) and (14) are correct because they involve some numerical measurement explicitly expressed by a measure phrases,

such as *weigh 200 pounds* and *paid 100,000 dollars per year*.

However, an explicit measure phrase is not obligatory to satisfy the need of the adnominal *together*. As Moltamnn suggests, what suffices the adnominal *together* is the measurement correlate. The measurement correlate consists of a measure function and a property of measurement. A measure function would be a function **explicitly** involving a particular measurement. For example, *weigh 500 kgs* and *lose 100 million dollar*s are predicates with a measure function. The following is the formal definition of the measure function:

(15) For an additive measure function f from the structure $(D,\vee)$, for a set of entities D, to the structure $(R,+)$, for a set of real numbers R, for any world w and time t, and entities $d \in D$ and $n \in R$, $< d,n,f > \in$ $\text{TOGETHER}^{w,t}$ iff $f(d) = n$.

In English: for an additive measure function f, $(D,\vee)$ is a structure in which D is a set of groups and individuals, which is closed under group formation $\vee$. In a numerical system, a structure $(D,\vee)$ would be represented as $(R,+)$, in which R is a set of real numbers closed under the operation of addition +. In a possible world or model, d is a member of D, and n is a member of R, and this additive measure function f applying to d would be equal to n if and only if $<d,n,f>$ is in the domain of TOGETHER.

Unlike the measure function, the property of measurement is presented by implicit measure phrases like *less than 5000* or *be a great number*. More specifically, the property of measurement denotes a property involving comparing or measurement implicitly. Therefore, the comparative sentences or predicates whose lexical meanings inherently involving measurement are means in presenting the property of measurement. Consider examples (16) and (17):

(16) John and Mary together are heavier than Sue and Bill

(17) The children of John and Mary together outnumber those of Bill and Sue together.

Example (16) is a comparative sentence with the predicate *heavier than,* which involves a comparison between the total weight of John and Mary and the total weight of Sue and Bill. In (17), *outnumber* is a predicate whose meaning involving counting or measuring. Given (16) and (17), it is relevant that the adnominal *together* fits comfortable with implicit measure or the property of measurement even no explicit measure phrases is presented. As analogous to the formula of the measure function, Moltamnn also provides the formula of the property of measurement as shown below:

(18) For an intensional additive measure function *f* from the structure $(D,\vee)$, for a set of entities *D*, to the structure $(R,+)$, for a set of real numbers *R*, for a property *S* of real numbers, for any world *w* and time *t*, and any entity *d* $\in D$, $<d,f,S> \in \text{TOGETHER}^{w,t}$ iff $f^{w,t}(d) \in S^{w,t}$.

In English: for an intensional additive measure function *f*, $(D,\vee)$ is a structure in which *D* is a set of groups and individuals which closes under group formation$\vee$. In a numerical system, a structure $(D,\vee)$ of a set of entities *D*, would be either represented as $(R,+)$, in which *R* is a set of real numbers closed under the operation of addition +, or as S which is a property of real numbers. In a possible world or time, any entity *d* is a member of *D*, $<d,f,S>$ would be in the domain of TOGETHER if and only if this function *f* applying on *d* in a domain of world and time is a member of the measure property *S* in a domain of world and time.

Given that a measurement-based theory explains the meaning and function of the adnominal *together* in an elegant way, Moltmann further extends such new analysis to the adverbial *together*. Unlike the adnominal *together,* the adverbial *together* would take sums of events or subevents as measuring entities and the property INT-WH as the measuring property[2]. In such sense, the adverbial *together* indicates that members of a group are engaged in activites or states that jointly make up the event or state. Further, such event or state forms an integrated whole to

[2] Moltamnn argues that the adnominal *together* only deals with the generalized-quantifier meaning and the meaning of predicates, not events, while the adverbial *together* involves event arguments of predicates.

respect the semantic meaning and function of the adverbial *togeteher*. Stated differently, the sum event consisted of the subevent that the group members contribute must be an interated whole in any possible dimentions.

The following formal formulae in (19) are the formal formulae of the adverbial *together*. Note that f_e is the function which maps individuals to the subevents which members of a group are engaged and f_e is also an additive measure function, mapping *d* into an event *e*, and *d'* into an event *e'* and the group consisting of *d* and *d'*, that is, $d \vee d'$, into the event $e \vee e$'.

(19) a. For any world *w* and time *t*, and two-place intensional relation *R*,
$[[\text{TOGETHER}_{\text{adverb}}]]^{w,t}(R)=\{<d,e>|<d,e>\in R^{w,t}\&<\text{d},f_e,\text{INT-WH}>\text{TOGETHER}^{w,t}\}$

b. For any world *w* and time *t*, and three-place intensional relation *R*,
$[[\text{TOGETHER}_{\text{adverb}}]]^{w,t}(R)=\{<d,d',e>|<d,d',e>\in R^{w,t}\&<\text{d},f_e,\text{INT-WH}>\text{TOGETHER}^{w,t}\}$

By comparing the analysis of the adverbial *together* of Moltamnn (1994) with that of Moltamnn (2004), a central property, namely the property INT-WH, is found to be always embrassed in Moltmann's old and new analysis. Actually, Moltmann's new analysis (2004) focuses on the adnominal *togeth*er, but the way he treats the adverbial *together* in his measurement-based theory makes trivial differences from the analysis in Moltamnn(1994). In Moltamnn(1994), the adverbial *together* is defined as a part-structure modifier which requires its arguments to be an integrated whole in any compatible dimensions relevant in situations. Thus, such spirit in Moltamnn (1994) remains in Moltamann (2004) because these two analyses of the adverbial *together* both demand arguments of *together* to have the property INT-WH.

3. Mandarin *yibing*

Mandarin *yibing* is usually translated into English *together.* In previous section, we briefly introduce English *together*. The adverbial *together* is analyzed as specifying collective actions, coordinated actions, spatiotemporal proximity, or temporal proximity. This section will discuss Mandarin collective marker *yibing* in terms of syntax and semantics properties.

3.1 Semantics analysis of *yibing*

Kuo (2007) treats *yibing* as a theme-oriented part-structure modifier which requires its theme arguments to form an integrated whole or to have the property INT-WH. Consider (20) and (21) shown below:

(20) Zhangsan ba shu han ziliao yibing jiao gei Lisi.
Zhangsan BA book and paper together give to Lisi.
'Zhangsan gave books and paper together to Lisi.'

(21)* Zhangsan ba shu yibing jiao gei Lisi
Zhangsan BA book together give to Lisi.
'Zhangsan gave book together to Lisi.'

Kuo's analysis explains the difference between the sentences in (20) and (21). The theme objects *shu* 'books' and *ziliao* 'papers' in (20) form an integrated plural object to be modified by *yibing* 'together'. The theme object *shu* 'book' in (21) is singular; hence, the sentence in (21) is ungrammatical. However, Kuo's analysis is not complete enough to explain why the sentence (22) is ungrammatical.

(22) * Zhangsan yibing xihuan Xiao Mei han Xiao Li
Zhangsan together like Xiao Mei and Xiao Li
'Zhangsan like Xiao Mei and Xiao Li together.'

In (22), *yibing* modifies the theme *Xiao Mei han Xiao Li*. If Kuo's analysis is

correct, the sentence (22) is expected to be grammatical. However, sentence (22) is not accepted to most of native speakers. What's the reason? This paper finds that the feature theme-orientation is not complete enough for the modifier *yibing*. We, therefore, propose that *yibing* is not only theme-orientated. *Yibing*, on the other hand, has to occur in the event structure with two critical properties, i.e. change of state and affectedness. Before going into the verification of this assumption, some basic concepts about change of states and affectedness should be introduced first and then to explain our analysis.

3.1.1 Affectedness and Change of State

The term "affectedness" in the literature is usually tied to a notion of change-of state. Change-of-state includes state-changing, location-changing, existence-changing, etc. Jackendoff (1990) and Beavers (2006) generalize sorts of affectedness as shown in (23).

(23) a. Changing state: change in some measurable property of x. (clean/paint x)
e.g. John painted the wall green.

b. Changing location: x moves to and stays at some new location. (move/push x)
e.g. John pushed his car to the gas station.

c. Coming into existence: x comes to exist (more than before). (build x)
e.g. John built his own garage.

d. Going out of existence: x ceases to exist (more than before). (destroy x)
e.g. John destroyed his house.

e. Transforming: x becomes something wholly different.
(turn x (into y))
e.g. John makes these fruits into a glass of juice.

f. Changing possession: x changes hands. (give x (to y))
e.g. John gave this glass of juice to Mary.

g. Coming to possess: x possesses something new.

(grace x (with y))

e.g. His Eminence graced the banquet by his presence.

h. Ceasing to possess: x loses something. (deprive x (of y))

e.g. John lost his father by cancer.

(Beavers 2004:2)

To derive sorts of affectedness shown above, entities that are usually objects, themes or patients, must undergo some actions or activities performed by agents, controllers or forces. That is, affectedness is formed by interactions among affecters, affectees and consequences following affecting action or activities. And, this is the reason why affectedness is closely related to objecthood (or patienthood) and transitivity of predicates (Jackendoff 1990, Beavers 2006 and among others).

In the hope to survey affectedness in more depth, some recent studies interpret AFFECT as a linking relation between a causative (or control) event and a becoming (resultative) event (Tang 2002, Huang 1997, Li 2000 and related works). Especially in Tang (2002), he argues that alternatives between the causative-transitive and the inchoative-intransitive use of ergative predicates depends on the completeness of a composite event which contains a superevent and a subevent. A superevent is identical to a causative event, and a subevent denotes an inchoative or resultative event. When a superevent is not presented, ergative predicates are in inchoative uses; on the other hand, when a superevent is available, ergative predicates present causative uses. Examples (24) and (25) illustrate such contrast.

(24) The door opens. (*open* in the inchoative use)

(25) John opens the door. (*open* in the causative use)

In (24), the ergative predicate *open* is in the incholative use because of the lack of an agentive subject, while in (25), *open* presents the causative use by the help of the agentive subject, *John*.

Moreover, in order to exhibit relationships between predicate types and event

structures in a more accessible way, Tang provides the following diagram.

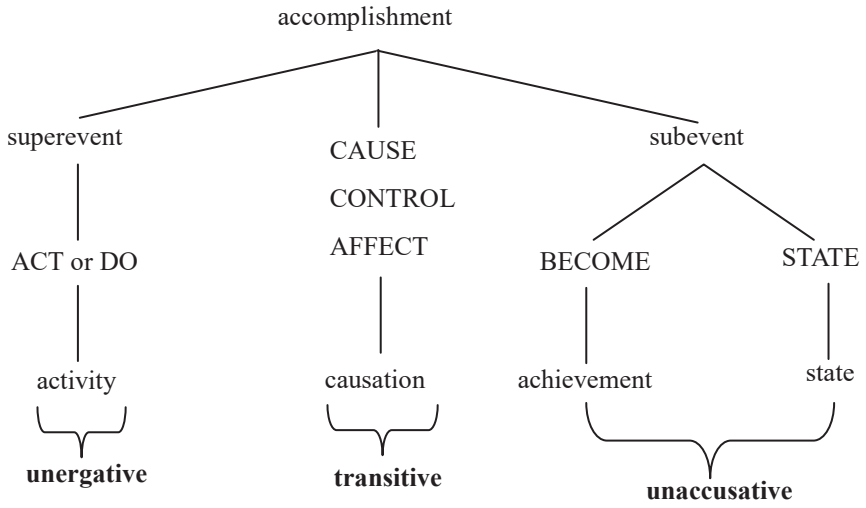


Figure1. Relationship between predicate types and event structures

As shown in Figure 1, predicate types written in a lowercase form, such as activity, accomplishment, achievement and state, represent four verbal categories: 'activity', 'accomplishment', 'achievement' and 'state', as proposed by Vendler (1957) in terms of aspectuality. Those which are in the capital form denote to semantic predicates, or we may call them eventuality predicates, which contribute to shape eventuality of events[3]. And, those in the boldface form mark the syntactic verbal subcategories.

Tang further subcategories semantic predicates relative to the causative meaning into three types: CAUSE, CONTROL, and AFFECT, by the strength of intention of agentive subjects. More specifically, CAUSE is the semantic predicate which exhibits the energetic causative meaning. With this semantic predicate

[3]Eventuality predicates would contribute to shape eventuality of events by adding aspect information to events. For example, in the sentences *Lisi da-le Wangwu* 'Lisi hit Wangwu', the marker *le* is the eventuality predicate which adds the accomplishment sense to the hitting event.

CAUSE, the strong intension of causers is relevant to see. Unlike CAUSE, AFFECT lacks such strong causative meaning and only indicates the relationship of reasons and results. Therefore, no intension of causers or doers is available when AFFECT is used. Among these three semantic predicates, CONTROL is the middle of CAUSE and AFFECT. That is, CONTROL does not have a strong causative meaning like CAUSE, but unlike AFFECT, it still has a causative meaning at some extent.

To demonstrate how Figure 1 represents event structures of sentences, a concrete example is illustrated in (26):

(26) John painted the wall green.

(27) [[John ACT ON paint] CAUSE [the wall [BECOME][BE AT green]]]

Example (26) reports a telic event which John painted the wall and the wall became green by John's painting. Example (27) is the event structure presentation of (26). By (27), it is relevant that the superevent, John ACT ON paint, causes the subevent, the wall BECOME BE AT green, to have a state changed.

To summarize, this subsection has reviewed some basic concepts about affectedness and interactions between predicate types and event structures. In the next section, the ideas about affectedness, change-of-state and event structures relative to CAUSE, CONTROL and AFFECT would contribute to the analysis of the modifier *yibing*.

3.1.2 Affectedness, Change of State and the Modifier *yibing*

In previous Section, we propose that the event features 'change of state' and 'affectedness' are crucial to the modifier *yibing*. Our suggestion is firmly grounded by examples (28) and (29).

(28) a.* Zhangsan yibing xiu yizi han zhuozi[4]
Zhangsan together fix chair and table
'Zhangsan fixed the chair and the table together.'
b. [[Zhangsan ACT ON fix the chair and table together]]

(29) a. Zhangsan yibing xiu hao yizi han zhuozi
Zhangsan together fix well chair and table
'Zhangsan fixed the chair and the table well together.'
b. [[Zhangsan ACT ON fix the chair and table together] CAUSE [the table and the chair together[BECOME][BE AT intact]]]

The examples (28) and (29) are contrasted by the resultative complement *hao* 'well'. By examining the event structure (28b), we find that (28) does not involve a subevent which represents a result or change-of-state. However, when the resultative complement *hao* 'well' is added, a subevent relative to change-of-state is available and makes the ungrammtical sentence acceptable, as shown in (29).

Therefore, the ungrammticality of (22), repeated as (30), is due to no change-of-state available in stative predicates.

(30) * Zhangsan yibing xihuan Xiao Mei han Xiao Li
Zhangsan together like Xioa Mei and Xiao Li
'Zhangsan like Mei and Lily together'

Based on the verbal classification of Vendler (1957), he classified verbs into four categories: activity, accomplishment, achievement and state in terms of aspects. Among these verb categories, state is the subclass which involves no change and is atelic and homogeneous. Therefore, the predicate *xihuan* 'like', a true stative predicate, offers no change-of-state, and further contradicts the feature of the modifier *yibing*.

So far, we have verified that the property of event structure, i.e. change of stat,

[4] According to the reviewer's suggestion, we change the example (28) from *Zhangsan yibing xiu-le yizi han zhuozi* to *Zhangsan yibing xiu yizi han zhuozi*

is crucial to *yibing* occurred sentence. The following discussion would focus on how semantic predicates: CAUSE, CONTROL and AFFECT affect *yibing*. Consider examples (31)-(33):

(31) Zhangsan xuyidi yibing guanzui le Lisi han Wangwu.
Zhangsan deliberately together fuddle ASP Lisi and Wangwu.
'Zhangsan deliberately fuddled Lisi and Wangwu together.'
(semantic predicate:CAUSE)

(32) Zhangsan shunbian yibing da hao le yinghuo han zhangpeng
Zhangsan passingly together build well ASP campfire and tent.
'Zhangsan built a campfire and a tent together passingly. '
(semantic predicate:CONTROL)

(33) Zhangsan yibing xuehui le fawen han yingwen
Zhangsan together learned ASP French and English
'Zhangsan learned French and English together.'
(semantic predicate:AFFECT)

Examples (31)-(33) are variants of Tang, which indicate the differences among the semantic predicates: CAUSE, CONTROL and AFFECT. As mentioned in Subsection 4.4.1, these semantic predicates are distinguished by the strength of the causative meaning and intension of causers or controllers. One way to ensure intension of causers or controllers is to insert adverbs, such as *deliberately*, *passingly* and *causally*, to add information relative to agents' activities and intentions. Hence, *Zhangsan* in (31) is a causer responsible for the fuddled Lisi and Wangwu; in (32), *Zhangsan* becomes a controller for establishing a tent and a campfire; as in (33), *Zhangsan* is the affecter and affectee of learning English and France. As shown in (31)-(33), it is relevant that *yibing* can modify these three semantic predicates because each of them involves a subevent or a result of change-of-state. Thus, we can make a preliminary conclusion that the modifier *yibing* can modify transitive semantic predicates: AFFECT, CONTROL and CAUSE. Since *yibing* can modify AFFECT, CONTROL and CAUSE in a bottom-up way, we will adopt the 'bottom' semantic predicate AFFECT as the

property which *yibing* respects.

However, not all sentences modified by *yibing* contain explicit causers or controllers. Consider (34) and (35).

(34) Yingsuo shui gen zongsuoshui keyi yibing jiaona
Business tax and income tax can togther pay
'Business tax and income tax can be paid together'

(35) Na liang-ming tanwu de guanyuan zuotian yibing bei qisu- le
Those two-CL corrupt DE_{mod} officers yesterday together were impl-ASP
'Those two corrupt officers were caught together yesterday.'

In (34) and (35), we cannot find any visible causers or controllers, but they are still acceptable in their inchoative meaning which express change-of-state. Note that the subjects of (34) and (35) receive a theme and a patient theta role, respectively. By receiving a theme and patient theta role, examples (34) and (35) exhibit the objecthood or patienthood related to affectedness. As a result, the event properties change-of-state and affectedness required by *yibing* are respected in (34) and (35) even when causers or controllers are invisible.

However, when the objecthood or patienthood related to affectedness is not available, sentences with *yibing* would be excluded because affectedness is not respected. Consider examples (36)-(38).

(36)* Xiao Mei han Xiao Li yibing liulei
Xiao Mei and Xiao Li togheter tear
'Xiaomei and Xiaoli together tear'

(37) Zhangsan de wuqing shide Xiao Mei han Xiao Li yibing liulei
Zhangsan DE_{mod} callous make Xiao Mei and Xiao Li together tear
'Zhangsan's indecision made Xiaomei and Xiaoli tear together'

(38) Xiao Mei han Xiao Li yin Lisi de wuqing er yibing l liulei
Xiao Mei and Xiao Li because Lisi DE_{mod} callous hence together tear
'Xiaomei and Xiaoli together teared for Zhangsan's indecision'

Though *Xiao Mei* and *Xiao Li* in examples (36)-(38) all involve change-of-state, the example (36) is still ungrammatical. Examining (36)-(38) carefully, we find that *Xiao Mei* and *Xiao Li* in (36) are recognized as the tearing experiencers. But, in (37) and (38), they all became affectees or patients who suffer from Lisi's callous. In other words, in (37) and (38), the superevent, namely Lisi's callous, guarantees the affectee or the patient theta role which *Xiao Mei* and *Xiao Li* receive, and hence makes (37) and (38) grammatical. However, in the ungrammatical (36), the experiencers, *Xiao Mei* and *Xiao Li,* do not express patienthood to stand for affectedness. The lack of affectedness of (36) contradicts the requirement of *yibing*.

So far, in this section, we have argued that two event properties, namely change-of-state and affectedness, must be respected by the modifier *yibing*. Therefore, the modifier *yibing* is said to be a part-structure modifier which requires its plural affected and state-changed arguments to form an integrated whole. The following (39) is the semantic formulae of the part-structure modifier *yibing*.

(39) a. For any world *w* and time *t*, and two-place intensional relation *R* which quantifies over affectee arguments of motions or events.

b.$[[yibing\text{`TOGETHER'}_{adverb}]]^{w,t}(R)=\{<d,e>|<d,e>\in R^{w,t}\&<d,f_e,\text{INT-WH}>YIBING^{w,t}\}$

4. Syntactic feature of *yibing*

In this section, the syntactic mechanism of *yibing* will be discussed in terms of feature checking.

4.1 Checking feature and Mandarin collective modifier *yibing*

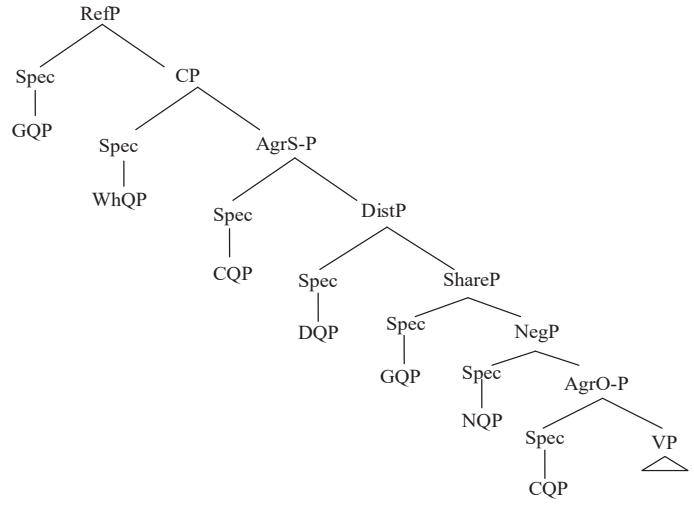
The most important syntactic feature of a collective marker is that the collective marker should have a collectivizing force and turn a plural NP into a group or an

integrated whole. To put it another way, they are collective modifiers which need to quantify over plural NPs. Based on this common collectivizing force, it is reasonable to assume that GQP modified by *yibing* should have the feature of [group ref.]. On the other hand, from the previous section, we also know that GQP modified by *yibing*'s should have the feature of [+affectee]. Hence, *yibing* should occur in an event structure which GQP with two crucial features named [group referent][5] (hereafter [group ref] for space limitation), which is borrowed from Beghelli and Stowell (1997)[6] and [affectee].

According to Beghelli and Stowell (1997), the collective reading is the consequence of the checking process of Group-Denoting QPs (GQPs). GQP is a type of QP which carries the feature [group ref] and needs to check this feature with an existential operator-head (∃). GQPs contain Indefinite QPs headed by *some*, *several*, bare-numeral QPs, like *three students*, and definite QPs like *the students.* Besides, the fundamental property of GQPs is that they denote groups, including

[5] Beghelli and Stowell assumes the feature [+group ref], while the feature adopted in this thesis is [group ref]; an element not specified with that feature is not a group referent.

[6] Beghelli and Stowell argue that scope of QP is determined by moving or projecting to specific positions at LF. Based on functions of QP, Beghelli and Stowell further divide QP into five types: Interrogative QPs (WhQPs), Negative QP(NQPs), Distributive-Universal QPs (DQPs), Counting QPs (CQPs), and Group-Denoting QPs (GQPs). The following tree diagram represents the relative scope positions of these five QP-types (Beghelli and Stowell 1997:76).



Moreover, each type of QP needs to check features that are associated to QP-types. For example, *nobody* is defined as a NQP with the feature [+Neg] and needs to check [+Neg] in Spec of NegP, under agreement with Neg-operator in Neg0. However, instead of introducing all the QP-types, only GQP which is crucial to the collective reading would be introduced in this section.

plural individuals.

Though Beghelli and Stowell restrict the feature [group ref] to quantificational NPs, i.e. *three students* and *some girls*, we propose that the [group ref] can also be the feature of the adverbs, such as *together* in English and *yibing* in Mandarin. Our proposal is grounded by the facts that quantificational NPs, such as *some students*, and quantificational adverbs, i.e. *together* in Englis*h and yibing* in Mandarin, are scopal operators in essence and each of them can exhibit the collective reading.

On the other hand, the GQP's [affectee] feature is an uninterpretable feature for Mandarin *yibing*[7]. If this feature can't be checked by LF, the sentence will be ungrammatical. In the following section, we will look how syntactic process works on this.

4.2 Syntactic Process

4.2.1 Syntactic Mechanism

In this section, we will look into the syntactic process of *yibing* occurred sentences.

This paper follows two syntactic mechanisms. One is Beghelli and Stowell's postulation of DisP as a functional projection. We treat CollectiveP as a functional projection, too. The *yibing* can be treated as a head of functional projection Collective P.

The other mechanism is Chomsky's feature checking. Chomsky posits on uninterpretable feature and interpretable feature in (40).

(40) Feature Value Correlation

(i) Interpretable features enter the derivation already valued

(ii) Features which enter the derivation unvalued are uniterpretable

[7] Thanks for the reviewer's suggestion. We change *yibing*'s feature from [+affectee] to uninterpretable feature.

Chomsky (1994, p.4) sees uninterpretable features as being at the very heart of agreement, and posits that 'Probe and Goal must both be active for Agree to apply' and that a constituent α (whether Probe or Goal) is active only if α contains one or more uninterpretable features. In other words, it is the presence of uninterpretable features on a constituent that makes it active (and hence able to serve as a probe or goal, and to play a part in feature-valuation and feature-deletion).

Furthermore, Chomsky (2001) ties valuation and interpretability, arguing all and only uninterpretable features (*u*Fs) are unvalued (41). Given Full Interpretation, *u*Fs, which semantics cannot deal with, must be eliminated before reaching semantics. This is done through their deletion, a prerequisite for which is valuation (42).

(41) A feature F is uninterpretable iff F is unvalued.

(42) Only valued uninterpretable features can be deleted.

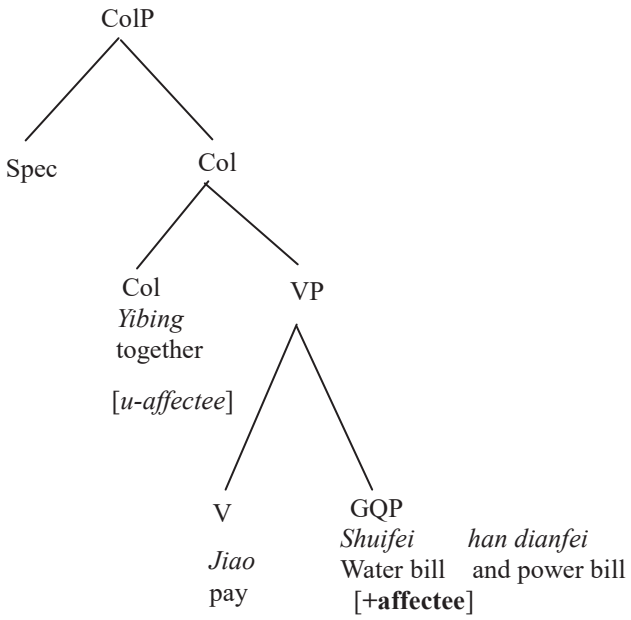
4.2.2 Syntactic process of *yibing*

Base on the mechanisms mentioned in previous section, we will now turn into the syntactic process of Mandarin Collective Marker *yibing* in this section.

Consider examples (43) and (44) with the modifier *yibing*. Limited by space, the tree diagram (44) below represents the partial structure of (43).

(43) Zhangsan yibing jiao le shuifei han dianfei
Zhangsan together pay ASP waterbill and power bill
Zhangsan paid water bill and power bill together.

(44)



As shown in (44), the GQP object, *shuifei* and *dianfei*, carries the feature [+affectee]. The collective marker *yibing* has unvalued (uninterpretable) affectee feature. Using a transparent feature notation, let's say that NP object, *shuifei* and *dianfei*, enter the derivation carrying the feature [+affectee]. Similarly, let's suppose that collective marker *yibing* enter the derivation with its affectee φ features as yet unvalued (because they are going to be valued via agreement with a GQP goal). In the light of these assumptions, let's see how the derivation of (44) proceeds.

The GQP, *shuifei* and *dianfei*, is the thematic complement of the verb *jiao* and so merges with it to form the VP *jiao shuifei han dianfei*. This is in turn merged with the collective marker *yibing,* forming the structure (44) above (where already-valued features are shown in **bold** and unvalued features in *italics*). On the probe and goal operation, which proposed by Chomsky 1999, the unvalued φ features on the probe are valued by the goal. It is the unvalued or uninterpretable affectee feature which serves as the probe rather than the item *yibing* itself. Accordingly, an agreement relation is established between the probe *yibing* and the goal *shuifei han dianfei* One reflex of this agreement relation is that the

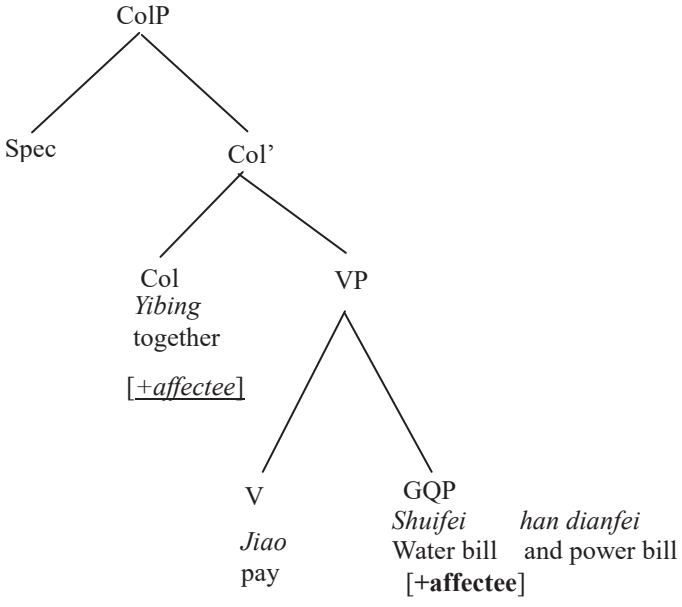
unvalued and affectee features carried by the probe *yibing* are valued by the goal *shhuifei han dianfei*. Valuation here involves a feature-copying operation which we can sketch in general terms as (45) (where α and β are two different constituents contained within the same structure, and where one is a probe and the other a goal):

(45) Feature-Copying

If α is valued for some feature [F] and β is unvalued for [F] and if β agrees with α, the feature-value for [f] on α is copied onto β

In consequence of the Feature-Copying operation (45), the value of the affectee feature of *shuifei han dianfei* is copied onto *yibing*, so that the unvalued affectee featue [u-affectee] on *yibing* in (44) are assigned the [+affectee] values carried by *shuifei han dianfei*, as shown in (46) below, where the underlined feature is that which has been valued via the Feature Copying operation (45):

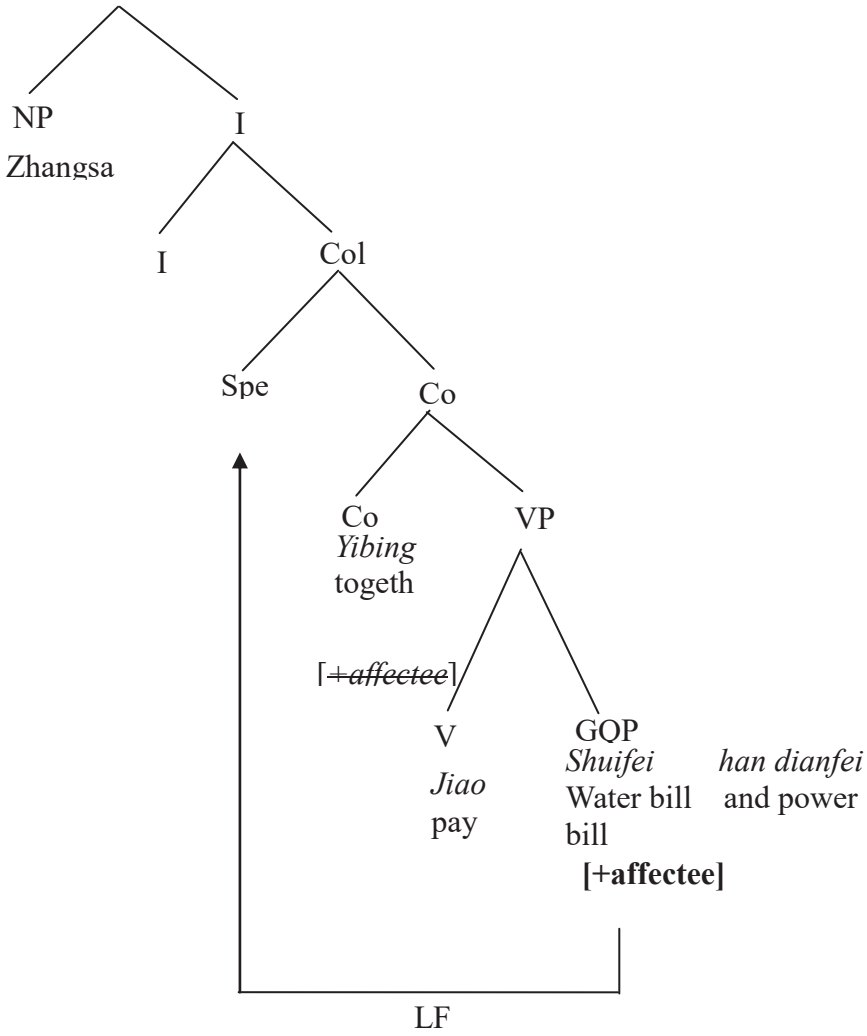
(46)



Finally, by LF, the object move to [Spec, ColP] to check it's [+affectee] feature with the head *yibing*. Since all uninterpretable features of *yibing* are valued and

then the *yibing*'s unintepretable feature which semantics can't deal with can be deleted at this stage, as in (47).

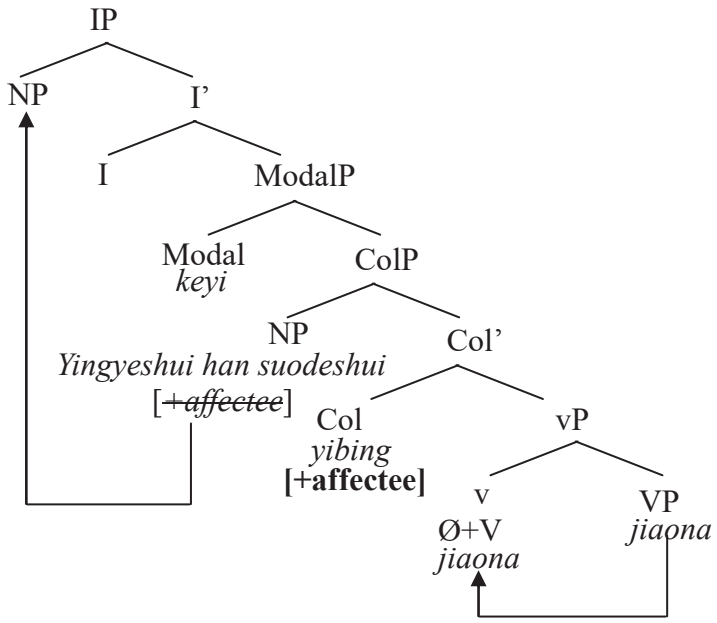
(47)



The inchoative sentence (48), on the other hand, reveals that the GQP move to different domain.

(48) Yingyeshui han suode　shui　keyi　yibing　jiaona
Business　tax　and income tax　can　together pay
Business tax and income tax can be paid together.

(48)



As illustrated in (48) the derivation of merger starts when the inchoative predicate *jiaona* 'pay' merges with the null BECOME light verb, namely Ø. The main predicate *jiaona* 'pay' than moves to v for the affixial nature of light verbs. Later, vP merges with the modifier *yibing* to form Col'. Put further, the node Col' further merges with a plural NP *yingyeshui han suodeshui* 'business tax and income tax', which inherently carries the feature [+group ref] and [+affectee]. By the syntactic procedure, the uninterpretable feature [afectee] of *yibing* makes feature check with the plural NP, i.e. *yingyeshui han suodeshui*, in the domain of ColP. The syntactic process is the same as examples (43).

Obviously, from the previous procedure, we find that the modifier *yibing* must match with an element which carries the crucial features: [+affectee]. Furthermore, the feature [+affectee] would mainly decide directionality of feature checking. That is, when a NP carrying the features [+affectee] and [+group ref]

realizes as an object of VP, the checking operation will occur in the complement domain: when such NP realizes at [Spec, ColP], the checking domain would be the place where feature-checking occurs.

5 Conclusion

This paper not only discusses the Mandarin collective marker *yibing* but explores its interaction with event structure from syntactic and semantic perspectives. In semantic perspective, we conclude that that *yibing* is not only a theme-oriented collective marker, but also requires its argument to have the property INT-WH. The GQP modified by *yibing*'s has the event feature of change of state. Meanwhile, we discuss *yibing*'s syntactic features. *Yibing* requires its modifiee has the features of [+group ref.] and [+affectee]; however, the feature [affectee] is uninterpretable for *yibing*. The GQP modified by *yibing* should have [+group ref.] feature and [+affectee] feature. For full interpretation, *yibing* has to make feature check with the GQP and deletes its uninterpretable features. If *yibing*'s uninterpretable feature can't be deleted by LF. The sentence will be ungrammatical.

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本論文於 2016 年 4 月 15 日到稿，2016 年 6 月 22 日通過審查。