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Bundling telicity, verbal quantification, and perfective aspect: A study on *lə* in Yixing Chinese

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This paper investigates the properties of a particle, *lə*, in Yixing Chinese that invariably denotes telic reading, obligatorily fronts definite and bare NP objects to the topic position, and imposes past event reading in most situations. It is argued that *lə* is a functional item bearing a quantity feature in the sense of Borer (2005b) and is hence responsible for telicity. Following Partee et al. (1987), Partee (1990), Filip (1997) and Borer (2005b), we propose that *lə* functions as a verbal quantifier, and more specifically, as a verbal universal quantifier, which needs to bind a variable in its quantificational domain. The fronting of definite and bare NPs is compatible with this variable-binding requirement because a trace, and hence a variable, is left as a result of the movement. It is further argued, following the analysis in Lin (2000, 2003, 2007), that *lə* bears a perfective feature. When there is no specific reference time, speech time is taken as default reference time, resulting in the past event reading. *lə*, therefore, bears both an inner aspectual feature and an outer aspectual feature. This paper exhibits how telic items can behave differently across languages and shows the possibility of bundling two temporal features (inner and outer aspectual features) on a single functional item.

KEYWORDS: perfective aspect, telicity, verbal quantification, Yixing Chinese

1. Introduction

It has long been argued that the concept of aspect actually consists of two different categories, one being the outer aspect (i.e. viewpoint aspect), such as progressive aspect in English, and the other being the inner aspect, also termed situational or aktionsart aspect, which concerns the internal temporal structure of an event and is related to the boundedness, or telicity, of an event (Vendler 1957, Smith 1997, Ritter & Rosen 2000, MacDonald 2008, Travis 2010). While there is very little controversy over the claim that an outer aspectual head exists in syntax, the nature of inner aspect is still in debate. Following Vendler's (1957) seminal work, inner aspect is often taken as part of lexical information; for example, achievement and accomplishment predicates are assumed to be telic predicates. However, it is proposed in some recent work on the syntax of aktionsart, which we term the syntactic approach to telicity, that telicity is the result of syntactic derivation (Tenny 1994; Ritter & Rosen 2000; Borer 2005a, b; MacDonald 2008; Travis

2010). For example, Borer (2005a, b) argues that there is a functional head responsible for the interpretation of telicity, and telic interpretation is achieved when the feature on this head is valued (or, in terms of Borer (2005a, b), when the open value on the head is assigned a range).

In addition to the conceptual reasons, such as the parallel relationship between the quantity interpretation in the nominal domain and telicity in the event domain, an empirical argument to support the syntactic approach to telicity is based on the fact that at least in some Slavic languages, there are telic markers, the perfective prefixes[1], that determine the telicity of an event. The following Russian examples exhibit this point:

(1) (a) Ja vypil butylku vina za čas/*v tečeniji časa.
I drank-PERF. a-bottle of-wine in hour/*during hour
'I drank a bottle of wine in an hour/*for an hour.'

(b) Mary pročitala knigu za čas/*v tečeniji časa.
Mary read-PERF. a-book in hour/*during hour
'Mary read a book/poetry in an hour/*for an hour.'

MacDonald (2008: 146)

In English, the existence of an accomplishment predicate and a quantity object can give rise to a telic event; in Russian, however, without a perfective prefix, telicity cannot be yielded:

(2) (a) Ja pil butylku vina *za čas/v tečeniji časa.
I drank-IMP. a-bottle of-wine *in hour/during hour
'I drank a bottle of wine *in an hour/for an hour'

(b) Mary čitala knigu *za čas/v tečeniji časa.
Mary read-IMP. a-book *in hour/during hour
'Mary read a book/poetry *in an hour/for an hour.'

MacDonald (2008: 146)

While a directional PP can turn an activity event into a telic one in English, without a perfective affix, telic interpretation is just impossible in Russian:

(3) (a) Fermer tasčil brevno v ambar
The farmer dragged-IMP. the-log into the-barn
*za čas/ v tečeniji časa.
*in hour/ during hour.
'The farmer dragged the log into the barn *in an hour/for an hour.'

[1] In the traditional sense, perfectivity is related to the outer aspect denoting the point of view, but in Borer (2005b), Slavic perfective affixes provide a telic feature, hence responsible for the derivation of telicity. We follow Borer's notion here to use this terminology in describing Slavic data. However, in 4.3, in the explanation of the Yixing data, perfective is used in the traditional sense to denote outer aspectual information.

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(b) Ptisi leteli k kletke *za čas/v tečeniji časa.
The-birds flew-IMP. toward their-cage *in hour/for hour
'The birds flew toward their cage *in an hour/for an hour'
MacDonald (2008: 148)

With these telicity-related properties in Slavic languages, we can already see some aspects of variation of telicity. In Slavic languages, telicity is morphologically realised, unlike English, which only relies on the quantity object and the predicate type (and sometimes directional PPs). Such variation provides clues as to the nature of telicity and sets the task of investigating the mechanism underlying the variation of telicity.

While studies on the strict relationship between perfective marker and telicity largely focus on Slavic languages (cf. Filip 1997, 2000; Filip & Rothstein 2000; Borer 2005b), it is tempting to explore whether there are non-Slavic languages that also involve a telic marker. This can enrich the theoretical inquiry in the nature of telicity and allow us to see whether there are other properties of telic markers that are not exhibited by the perfective prefixes in Slavic. This consideration is the starting point of the present paper. In Yixing Chinese, a variety of Chinese Wu Dialect spoken in Yixing County of Jiangsu Province, China, a marker, *lə*, looks very similar to the Slavic perfective prefix in terms of its telic marking:

(4) (a) achievement predicate
zaŋsa sazə fəŋʤoŋ lidou mə lə sa bəŋ ʃy.
Zhangsan thirty minute in lose lə three CL book
'Zhangsan lost three books in thirty minutes.'

(b) accomplishment predicate
zaŋsa sazə fəŋʤoŋ lidou ʧɛ lə sa ʤə biŋgo.
Zhangsan thirty minute in eat lə three CL apple
'Zhangsan ate three apples in thirty minutes.'

(c) bare nominal theme
ʤu ŋo jiʤiŋ ʧɛ lə le[2].
alcohol I already eat lə le
'I have drunk the alcohol (i.e. the certain amount of alcohol has been drunk up by me).'

The above examples show that, in Yixing, *lə* is directly responsible for telic interpretation. It co-occurs with achievement and accomplishment predicates in telic events ((4a) and (4b)). In addition, in languages like English, the nominal theme should be a quantity NP (e.g. *three apples*). In Yixing, when *lə* occurs, a bare nominal theme is acceptable if it is fronted to the topic position, and it will take a definite and quantity reading instead of a mass reading, as is shown in (4c). What further supports the observation that *lə* is responsible for telic reading is that,

[2] *le* is a sentence final particle, which corresponds to the sentential *le* in Mandarin, often expressing the speaker's assumption that the proposition expressed will be out of the listener's expectation.

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without this particle, telicity is impossible even if the predicate is a typical accomplishment or achievement verb with a quantity NP object:

(5) (a) *zaŋsa sazə fəŋʤo̯ŋ lidou mə (**ʤə**) sa bəŋ ʃy.
Zhangsan thirty minute in lose (**ʤə**) three CL book
Intended: 'Zhangsan lost three books in thirty minutes.'

(b) *zaŋsa sazə fəŋʤo̯ŋ lidou ʧɛ (**ʤə**) sa ʤə biŋgo.
Zhangsan thirty minute in eat (**ʤə**) three CL apple
Intended: 'Zhangsan ate three apples in thirty minutes.'

In the above examples, *ʤə* is a particle that denotes the temporal sequence between event time and reference time, which is responsible for perfect reading[3]. We put this particle in brackets to show that, as long as *lə* is not attached to the verb (whether another particle is attached or no particle follows the verb), the sentence will not take telic reading, as shown by the incompatibility with the time span adverbial *sazə fəŋʤo̯ŋ lidou* (in 30 minutes).

The above examples show that *lə* is similar to the Slavic perfective prefix in terms of telic marking. Apart from these properties, *lə* also exhibits properties that are not seen in Slavic languages. Firstly, *lə* has the function of anchoring an event to express past tense information. When *lə* is attached to the verb, past event interpretation seems to be obligatory. All the examples in (4) take a past event interpretation. This past tense reading cannot be overridden, even with explicit future event information provided by the adverbial, which only makes the sentence unacceptable:

(6) (a) *tɔ **miŋʤao** ʧɛ lə sa ʤə biŋgo.
he **tomorrow** eat lə three CL apples
Intended: 'He will eat three apples tomorrow.'

(b) tɔ **zoɲɛ** ʧɛ lə sa ʤə biŋgo.
he **yesterday** eat lə three CL apples
'He ate three apples yesterday.'

Another property of *lə* not shared by Slavic perfective prefixes is that it always fronts definite and bare NP objects to a topic position, while numeral NP objects are not affected:

(7) (a) *tɔ zoɲɛ ʧɛ lə **gə** sa ʤə biŋgo le.
he yesterday eat lə these three CL apples le
Intended: 'he ate these three apples yesterday.'

(b) **gə** sa ʤə biŋgo tɔ zoɲɛ ʧɛ lə le.
these three CL apples he yesterday eat lə le
'He ate these three apples yesterday.'

[3] Perfect readings can be of different types that are encoded differently across languages, as shown in Iatridou et al. (2001), Ramchand (2018). Since *ʤə* is not the focus of this paper, we leave it for future studies.

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(8) (a) *tɔ ʧɛ lə biŋgo le.
he eat lə apples le
Intended: 'He has eaten up the apples.'
(b) biŋgo tɔ ʧɛ lə le.
apple he eat lə le.
'He has eaten up the apples.'

(9) tɔ ʧɛ lə sa ʤ̩ə biŋgo le.
he eat lə three CL apples le
'He has eaten up three apples.'

As we can see from the above examples, whenever *lə* is involved, the bare NP and the definite NP have to be moved to the topic position, and the bare NP has to take a quantity and definite reading. In (8b), the bare nominal *biŋgo* (apple) has to mean a specific amount of apples that are known to the speaker and the hearer. On the other hand, if the object is a numeral NP, then it can stay in its post-verbal position, as shown in (9).

In this paper, we will explore the nature of *lə* in Yixing. We will also explain its relationship with telic interpretation, its similarity with the Slavic perfective prefixes, and the special properties not shared by the latter. This paper therefore will address the following issues:

(i) The syntax of telicity in Yixing and its similarity with the perfective prefix in Slavic languages
(ii) The fronting constraint imposed by *lə* on object NPs
(iii) The relationship between telicity and past tense reading in Yixing

The main points to be argued in this paper can be summarised as follows. *lə* is a functional item bearing a quantity feature (Borer 2005b) and is therefore responsible for the derivation of the semantics of telicity. It will also be proposed that *lə* is a verbal quantifier, specifically a universal quantifier, which requires a variable to be within its quantification domain. Definite NP and bare NP fronting is required so as to create a variable to be quantified over by *lə*. Additionally, although an inner aspect (telic) marker, *lə* also bears an [*i*Perfective] feature, which, together with the default taking of speech time as reference time, gives rise to past event reading. Therefore, in this paper, we argue that *lə* is an item that bears both an inner Asp feature and an outer Asp feature, hence exhibiting complex properties of temporal encoding.

The rest of this paper is organised as follows. Section 2 presents a detailed picture of the behaviours of *lə*, specifying the key issues to be addressed in the following sections. In section 3, we outline the theoretical toolkit to be applied for the account of the issues, which includes Borer's (2005b) syntactic approach to telicity and Filip's (1997) analysis of verbal quantification taken by the perfective prefix in Slavic. Our account is proposed in Section 4, and Section 5 concludes the paper, together with a summary of the implications derived from the analysis of this paper.

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2. *Lə*: Its syntactic and semantic properties

This section provides a detailed description of the syntactic behaviours and the semantic interpretation connected with *lə*, including its role played in telic interpretation, its effect on object NPs, and its relationship with past event reading.

2.1. *lə and telicity*

In Yixing, as mentioned in the introduction, *lə* obligatorily imposes a telic reading on an event. In a *lə* -marked sentence, the most natural internal argument is the one that takes the role of 'incremental theme' (Dowty 1991, Rothstein 2004). An incremental theme is usually an argument that measures up the event, representing a homomorphic mapping between the argument and the event. For example, *a glass of wine* is an incremental theme in the phrase *drink a glass of wine.* There is a one-to-one homomorphic mapping between the glass of wine and the drinking event. The consumption of the last drop of wine is also the endpoint of the drinking event. It is in this sense that predicates like *drink* are termed homomorphic predicates (Filip 1997), which are mainly accomplishment predicates in terms of Vendler's (1957) classification. Achievement predicates in Vendler's (1957) classification also denote telic events, which often express a change of state that takes place instantly.

In Yixing, achievement and accomplishment predicates with an incremental theme can occur in a *lə*-marked sentence, provided that the quantity and object fronting requirements are met and a telic interpretation always arises, as is evidenced by the compatibility with the 'in x time' phrase shown in the introduction (see the examples in (4)). Also, as shown in (5), repeated below, even when the predicate is achievement or accomplishment and the object is a quantity NP, still telicity will not be attested if *lə* is not there.

(10) (a) *zaŋsa sazə fəŋʤ̩oŋ lidou mə **ʤ̩ə** sa bəŋ ʃy.
Zhangsan thirty minute in lose **ʤ̩ə** three CL book
Intended: 'Zhangsan lost three books in thirty minutes.'

(b) *zaŋsa sazə fəŋʤ̩oŋ lidou ʧɛ **ʤ̩ə** sa ʤ̩ə biŋgo.
Zhangsan thirty minute in eat **ʤ̩ə** three CL apple
Intended: 'Zhangsan ate three apples in thirty minutes.'

It should be noted here that the ungrammaticality arises only because *ʤ̩ə* is not compatible with telic reading. In the above examples, the 'in x time' adverbial requires the telicity of the event, and *lə* is obligatory, which indicates that *lə* is responsible for telic reading. If the reading of telicity is not required, the sentence with *ʤ̩ə* becomes acceptable:

(11) zaŋsa ʧɛ **ʤ̩ə** sa ʤ̩ə biŋgo le.
Zhangsan eat **ʤ̩ə** three CL apple le
'Zhangsan has eaten three apples (the apples are not necessarily eaten up).'

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The above sentence without *lə* is grammatical, and it is obvious that the only difference between this sentence and the ungrammatical one in (10b) is that the adverbial 'in x time' that imposes telic reading requirement is not present. Although this sentence has both a quantity incremental theme and an accomplishment predicate, telicity is not attested, evidenced by the fact that the truth condition of this sentence does not require the three apples to be eaten up.

This presents a sharp contrast with English, which will express a telic event as long as the predicate is achievement or accomplishment and the object is a quantity NP:

(12) (a) John lost three books in 5 minutes.
(b) John ate three apples in 5 minutes.

What further shows the correlation between *lə* and telicity is that even if the sentence has an activity predicate, still telicity will be obligatorily derived:

(13) (a) zaŋsa sazə fəŋʤoŋ lidou tae lə sa tsɔ ho.
Zhangsan 30 minute in push lə three cart goods
'Zhangsan pushed three carts of goods in 30 minutes.'
(b) John pushed three carts of goods (* in 30 minutes).

It is well known, as shown in Vendler (1957), that activity predicates in English do not denote telicity. For example, (13b) will be very unnatural if the adverbial *in 30 minutes* is added, showing the difficulty of deriving telic reading from this sentence. However, in the Yixing example in (13a), even without the adverbial *sazə fəŋʤoŋ lidou (in 30 minutes)*, telic reading is obligatory. The reading is that there is an endpoint of pushing these three carts of goods. For example, Zhangsan's work is to push the goods away to some place, and in this context, this sentence means that three carts of goods have been pushed to that place. It should be emphasised here that *lə* obligatorily requires contextual information of this type to be compatible with the telic reading, which again shows that *lə* imposes telic reading.

2.2. *The effects of lə on the object*

There are three special issues regarding the effects of *lə* on the object: the quantity requirement, the object fronting requirement (only to definite and bare NPs), and the definiteness requirement (to the bare NP).

Firstly, if *lə* is attached to the verb, the nominal object must have a quantity reading. Whenever the object takes a non-quantity reading (like the readings of mass nouns and bare plurals in English), a sentence will be ungrammatical as long as *lə* is attached. A numeral NP therefore is a legitimate object in the *lə*-marked sentence:

(14) (a) ŋo ʧɛ lə sa ʤə biŋgo.
I eat lə three CL apple
'I ate up three apples.'

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(b) *ŋo ʧɛ lə biŋgo (le)[4].
I eat lə apple (le)
intended: 'I ate apples.'

(c) *ŋo ʧɛ lə ʤ̍u (le).
I eat lə alcohol (le)
Intended: 'I drank alcohol'

In the above examples, when the object takes the bare plural reading in (14b) or the mass reading in (14c), the *lə* -marked sentence becomes unacceptable.

The quantity condition can also be met by kind-denoting nominals, which further shows that *lə* is only sensitive to quantity reading, regardless of the semantic denoting of the NP:

(15) tɔ zoɲɛ ʧɛ lə sa zoŋ biŋgo.
he yesterday eat lə three kind apples
'He ate three types of apples yesterday.'

Another interesting issue regarding the effect of *lə* on the object is that bare NP and definite NP objects have to be fronted to the topic position if *lə* is attached to the verb. Let's start with the bare NP. (14b) and (14c) seem to show that bare NPs are always rejected in *lə* -marked sentences. However, this is not the case. These examples only show that they are rejected if they stay in the post-verbal position, taking a non-quantity (bare plural or mass) reading. For such bare NP objects to be legitimate, they have to be fronted to the topic position. There are three topic positions in Mandarin Chinese: the sentence initial position, the position after the subject and before the verb, and the complement position of *ba*. The topic positions in Yixing are exactly the same, except that the counterpart of *ba* is *nɔ*. When a bare nominal is fronted to one of these positions, it is compatible with *lə*. Another phenomenon related to this case is that the bare nominal must take a definite reading:

(16) (a) ʤ̍u ŋo ʧɛ lə le.
alcohol I eat lə le
'I have drunk up the (certain amount of) alcohol.'

(b) ŋo ʤ̍u ʧɛ lə le.
I alcohol eat lə le
'I have drunk up the (certain amount of) alcohol.'

(c) ŋo nɔ ʤ̍u ʧɛ lə le.
I take alcohol eat lə le
'I have drunk up the (certain amount of) alcohol.'

[4] We put the sentence final particle *le* in the brackets to show that the ungrammaticality of this sentence has nothing to do with the (dis)appearance of the sentence final particle.

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In all the above examples, the bare nominal *ʤ̍u* (alcohol) not only has to be fronted to a topic position, but also must take a definite and quantity reading. That is, all the above sentences have to mean that a certain amount of alcohol known to the speaker and the hearer has been drunk up. The same constraint also applies in (14b). For this sentence to be grammatical, the bare nominal *biŋgo* (apple) must move to one of the topic positions, and this noun must mean a certain amount of apples, which is the old information in the context.

In addition to bare nominals, a definite NP object also has to be fronted to the topic position if *lə* is attached:

(17) (a) *tɔ zoɲɛ ʧɛ lə **gə** sa ʤ̍ə biŋgo le.
he yesterday eat lə these three CL apples le
Intended: 'He ate these three apples yesterday.'

(b) **gə** sa ʤ̍ə biŋgo tɔ zoɲɛ ʧɛ lə le.
these three CL apples he yesterday eat lə le
'He ate these three apples yesterday.'

As we can see, the definite NP *gə sa ʤ̍ə biŋgo* (these three apples) cannot stay in the post-verbal position if *lə* is attached to the verb; instead, it must move to the topic position. Note that if *lə* is not there, for example, when it is replaced by the particle *ʤ̍ə*, this movement is not obligatory. The definite NP object can either stay in the base post-verbal position or move to the topic position:

(18) (a) tɔ zoɲɛ ʧɛ **ʤ̍ə** **gə** sa ʤ̍ə biŋgo le.
he yesterday eat **ʤ̍ə** these three CL apples le
'He has eaten these three apples yesterday.'

(b) **gə** sa ʤ̍ə biŋgo tɔ zoɲɛ ʧɛ **ʤ̍ə** le.
these three CL apples he yesterday eat **ʤ̍ə** le
'He has eaten these three apples yesterday.'

Below we see that other types of definite NPs, such as proper names, pronouns, and NPs modified by a relative clause, are also restricted by this constraint. In all the following examples, if the definite object NP is placed in the topic position, the sentence will be grammatical:

(19) (a) *waniŋ sə lə **zaŋsa** le.
bad-people kill lə Zhangsan le

(b) waniŋ nɔ **zaŋsa** sə lə le.
bad-people nɔ Zhangsan kill lə le
'The bad people had killed Zhangsan.'

(20) (a) *waniŋ sə lə **tɔ** le.
bad-people kill lə he le

(b) waniŋ nɔ **tɔ** sə lə le.
bad-people nɔ he kill lə le
'The bad people had killed him.'

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(21) (a) *tɔ ʧɛ lə **ŋo** **ma** **gə** **sa** **ʤə̣** **biŋgo** le.
she eat lə I buy gə three CL apples le
(b) tɔ nɔ **ŋo** **ma** **gə** **sa** **ʤə̣** **biŋgo** ʧɛ lə le.
she take I buy gə three CL apples eat lə le
'She had eaten the three apples that I had bought.'

Since the definite and bare NP objects have to be situated in the topic position, it might be argued that there is a correlation between topic construction and this object fronting. However, it shows below that even in a topic construction, as long as there is an indefinite quantity NP in the object position, the sentence is still grammatical, indicating that it is the incompatibility between *lə* and definite/bare NP objects in the base post-verbal position that plays a role here[5]:

(22) ʃygo, ŋo ʧɛ lə sa ʤə̣ biŋgo.
fruit, I eat lə three CL apple
'As for fruit, I ate three apples.'

lə's effect of object fronting only applies to bare and definite NPs, while numeral NPs are not constrained by this effect. In (14a), for example, the numeral NP *sa ʤə̣ biŋgo* (three apples) stays in the post-verbal position and *lə* is attached to the verb. Of course, as Chinese grammar generally allows, this numeral NP can move to the topic position if required by specific information packaging requirements. The crucial point here is that only in *lə* -marked sentences, bare and definite NPs – but not numeral NPs – have to move to the topic position.

We summarise the effects of *lə* on nominal objects as follows:

(23) The effects of *lə* on nominal objects

Types of NP objects	Effects of lə
bare NP	object fronting; quantity reading; definite reading
definite NP	object fronting
numeral NP	no effect attested; can stay in the post-verbal position; retains indefinite reading

2.3. *lə and past event reading*

In addition to telicity, another piece of temporal information related to *lə* is past event reading. The following examples illustrate this point:

(24) (a) zaŋsa ʧɛ lə ji bae kafi.
Zhangsan eat lə a CL coffee
'Zhangsan drunk up a cup of coffee.'

[5] I thank the reviewer for raising this issue.

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(b) *zaŋsa **maetie** ʧɛ lə ji bae kafi.
Zhangsan everyday eat lə a CL coffee
Intended: 'Zhangsan drinks up a cup of coffee everyday.'
(c) *zaŋsa **miŋdzao** yao ʧɛ lə sa bae kafi
Zhangsan tomorrow will eat lə three CL coffee
Intended: 'Tomorrow Zhangsan will drink up three coffees.'

As shown in (24a), when *lə* is attached, even without any past tense adverbial, the sentence obligatorily takes a past tense reading. In these examples, there is no possibility to override the past tense interpretation when *lə* is involved. (24b) shows that even with a habitual temporal adverbial like *maetie* (everyday), the present tense reading still cannot be yielded; instead, the sentence becomes ungrammatical, showing that the past tense reading imposed by *lə* cannot be overridden. The situation is the same in (24c), where a future temporal adverbial is not compatible with *lə*.

3. Theoretical toolkit: The syntax of telicity and the quantificational force of the telic marker

This section presents the theoretical toolkit to be applied in the account of the issues described in the last section. Two major theoretical ingredients are to be introduced: the syntactic approach to telicity in Borer (2005b) and the quantificational force of telic/perfective markers in Slavic languages that are studied in both Filip (1997) and Borer (2005b). In the process of this introduction, we will also see more aspects of telic marking in Slavic languages, which exhibit important similarities/differences in connection with the *lə* -related issues in Yixing.

3.1. *The syntax of telicity: Borer (2005b)*

While telicity is often taken as a lexical property (hence the term 'lexical aspect') (Vendler 1957, Filip & Rothstein 2000, Rothstein 2004), there are recent studies arguing that telicity is encoded in syntax (cf. Borer 2005b, Thompson 2006, MaDonald 2008, Travis 2010), according to which a functional head is responsible for the derivation of telicity. In this paper, we will adopt Borer's (2005b) theoretical framework, the Exo-Skeletal (XS) Model, on the syntax of events (also see Hu (2018)), which provides a specific account on the nature of telicity.

Like other researchers such as Bach (1986), Rothstein (2004), and many others, the XS Model captures the semantic parallelism between the domain of events (vP domain) and that of objects (DP domain). The XS Model takes a step further by specifying two parallel functional structures for events and nominals that explicate the semantic parallelism between these two domains. The functional structures encoding events and objects are EP (event phrase) and DP (determiner phrase). In an extended projection (i.e. functional structure), each functional head specifies an

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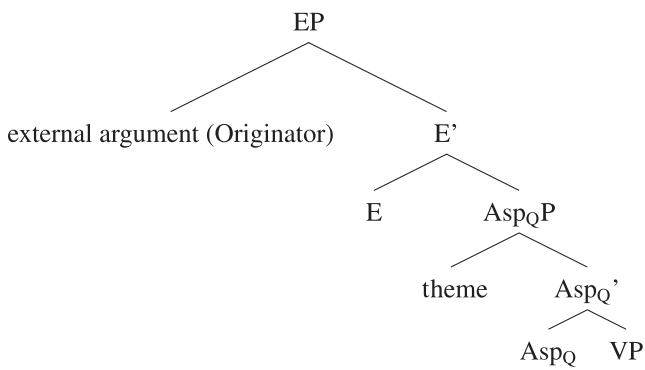
open value, which has to be assigned a range, hence giving rise to the semantic interpretation of the structure.

Range assignment can be either direct or indirect. The direct range assignment involves inserting a functional item in the corresponding functional head. A functional item can be an independent morpheme termed 'f-morph'. *Will* in English is such an f-morph which assigns range to the open value specified on the T head. A functional item can also take the form of a bound morpheme termed 'head feature', such as the English past tense affix *-ed*. The indirect range assignment can be instantiated by an adverb of quantification, a discourse operator, and specifier-head agreement. Range assignment via specifier-head agreement means that the open value specified on a functional head can be assigned a range if the phrase in the specifier position contains this range. Borer (2005a, b, 2013) postulates that the underlying reason for linguistic variation is often tied to how an open value is assigned the range. For example, variation might arise from whether the range is assigned in the shape of a bound morpheme or a morphologically independent functional item, or whether range assignment is achieved directly or indirectly. This is in line with the account of variation in minimalism, which attributes variation to features in the lexicon, which is often termed the Borer-Chomsky Conjecture, as is discussed in Baker (2008), Roberts & Holmberg (2010), and Borer (2013: 630). While there are various definitions of interpretable and uninterpretable features (Pesetsky & Torrego 2007), in general the pair of open value and range is the equivalent to the pair of uninterpretable and interpretable features. Therefore, for ease of exposition, in the rest of this paper, we will use the terms of uninterpretable and interpretable features.

The extended projection, EP, starts from a lexical item, often a verb, which is dominated by several functional heads in a fixed and universal hierarchical structure, represented as follows:

(25)



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The Asp_Q head in EP is the counterpart of the quantity head in DP and is responsible for the quantification of the event division, which is the source of telic reading of an event. Thus, in the XS Model, telicity comes from the valuation of the quantity feature specified on the Asp_Q head. In languages like English, the valuation of the quantity feature is often achieved via specifier-head agreement, which can copy the quantity value of a quantity DP in the specifier position of the Asp_Q onto the Asp_Q head, thereby giving rise to the interpretation of telicity.

We can take the following examples to illustrate the feature valuation of quantity in EP:

(26) (a) John ate three apples *in five minutes*.
(b) John ate apples **in five minutes/for five minutes*.

Following the XS Model, in (26a), it is the DP *three apples* in the specifier of the Asp_QP that provides the interpretable quantity feature to value the uninterpretable quantity feature on the Asp_Q head. The valuation of the quantity feature then gives rise to the semantic interpretation of the telicity of the eating event. On the other hand, in (26b), the bare plural *apples* does not bear an interpretable quantity feature, which means that, in this sentence, if an Asp_Q head projects, the valuation of the quantity feature cannot be achieved and therefore telic interpretation cannot be derived.

Just like the DP structure, in EP, the functional head specifying the quantity feature is optional. When the Asp_Q head does not project, which is exactly the case of atelic events, a layer of F^sP will appear in the otherwise Asp_Q position, and the [Spec F^sP] position will host a DP that is the theme of the event. Since this paper focuses on telicity, F^sP will not be discussed.

3.2. *Capturing telic variation: Indirect vs. direct valuation of quantity feature*

As we have seen from the outline of the XS Model, languages have the potential to vary due to the different mechanisms of valuing the features specified on the functional heads in an extended projection. Our concern is telicity. In English, the quantity feature on the Asp_Q head is valued via the indirect strategy, which is copying the quantity feature of a DP in the specifier position of Asp_QP (i.e. [Spec Asp_QP]) via agreement. In theory, it is possible that in some languages the direct valuation strategy might also be available; that is, there is a functional item in the lexicon that bears an interpretable quantity feature that can value the feature on Asp_Q.

In Borer (2005b), it is shown that this situation does exist in some Slavic languages. In languages like Czech, a perfective prefix serves as an event delimiter, which imposes a telic interpretation on the one hand, and also restricts the interpretation of bare nominal arguments by providing them with quantificational force:

(27) (a) Pil^I víno. (Czech)
drank-SG wine-SG-ACC
'He was drinking (the) wine.'

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(b) VyPil[I] víno. (Czech)
PERF-drank-SG wine-SG-ACC
'He drank up (all) the wine.'
Filip (1997: 2)

In (27b), the prefixed perfective verb gives rise to a telic interpretation. In addition, the prefix also forces a definite and quantity reading on the bare noun object. Without the perfective prefix, no telic reading is attested. Additionally, the bare noun in (27a) does not need to take a definite reading or quantity reading.

Borer (2005b) takes such data as evidence of the paradigm of direct range assignment (feature valuation). In particular, the perfective prefix in Slavic languages is the functional item that bears the interpretable quantity feature, which is directly inserted in the Asp_Q head to value the uninterpretable quantity feature ([*u*Quan] for short). In addition, when a bare nominal theme argument is involved, the perfective prefix copies the quantity feature to the quantity head in the DP structure and provides a strong D feature (with a definite force) to value the uninterpretable D feature ([*u*D]) on the D head of the nominal theme, as shown in (27b). In this paper, we adopt Borer's (2005b) general framework, but deviate in one aspect: the explanation of the definiteness of bare nominals in Slavic languages. For this aspect, we will draw on Filip's (1997) account to be summarised in the following sub-section, and we will show how this can be assimilated into Borer's framework.

3.3. *The quantificational force of the telic marker: Filip (1997)*

In the above examples, we already see that when a bare nominal is involved in a perfective prefix marked sentence in Slavic languages like Czech, it will not only take a quantity reading, but also a definite reading. In Borer's account, the source of definite interpretation is straightforward: the telic marker (i.e. the perfective prefix) provides a strong [D] feature to the bare NP in the object position. However, this assumption is weakened by the fact that indefinite numeral NPs can also stay in Slavic telic sentences where a perfective marker is prefixed to the verb. If the perfective prefix itself provides the strong [D] feature (i.e. the definite force), it will follow that an indefinite NP object in the [Spec QuanP] position will be impossible because this NP is in the scope of quantificational force of the [Quan] head (i.e., the perfective prefix that imposes definiteness force to it). The definiteness imposed by the perfective prefix and the indefiniteness taken by the numeral NP will thus give rise to semantic incompatibility. However, in Slavic, an indefinite NP object is actually possible:

(28) (a) Ja vypil butylku vina za čas/*v tečeniji časa.
I drank-PERF. a-bottle of-wine in hour/*during hour
'I drank a bottle of wine in an hour/*for an hour.'
(Russian)

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(b) Mary pročitala knigu za čas/*v tečeniji časa. (Russian)
Mary read-PERF. a-book in hour/*during hour
'Mary read a book/poetry in an hour/*for an hour.'
MacDonald (2008: 146)

(29) VyPil[I] šálek kávy /láhev piva. (Czech)
PERF-drink-SG. a-cup-of coffee/ a-bottle-of beer
'He drank a cup of coffee/a bottle of beer.'
Filip (1997: 22)

In the above examples, the objects are all numeral NPs, taking an indefinite reading and staying in the post-verbal object position. Borer's (2005b) solution is as follows: when a numeral NP object appears, this means that the quantity feature of this NP is already valued by the numeral, and the telic marker (i.e. the perfective prefix) is not responsible for the quantity feature of this DP. On the other hand, this numeral NP still needs its D feature for referentiality, and it is the perfective prefix that provides the weak D feature (existential closure), on the assumption that if the quantity and D features are not both valued by the prefix, the latter will provide a weak D feature. We find this solution is more or less ad hoc, as it is, in a sense, inconsistent to claim that the same prefix can sometimes assign a strong (definite) D feature and sometimes assign a weak D feature. It is better to assume that the perfective prefix does not bear any definiteness relevant feature (strong D feature in Borer's framework), and this is exactly the point taken in Filip (1997).

Filip's (1997) account draws on studies about the division of two types of quantification: the D-quantification and the A-quantification (Partee et al. 1987, Partee 1990). While the D-quantification is expressed in the NP by determiner quantifiers, the A-quantification is achieved by elements such as sentence adverbs, auxiliaries, and affixes, among others. Filip (1997) points out that while a perfective prefix makes a verb telic or bounded, it also functions as an A-quantifier, which binds the variable introduced by the NP object, and hence extends a semantic effect to the NP with its quantificational force. Following Comrie (1976), Filip (1997) makes the following proposal:

(30) The perfective operator has a **holistic** function with respect to the situation denoted by a verb predicate in its scope.
Filip (1997: 17)

The above assumption can be assimilated into Borer's (2005b) framework: the holistic function is roughly equivalent to the effect of the quantity ([Quan]) feature. The [Quan] feature provided by the perfective prefix imposes the interpretation that the event is a quantity one (i.e. telic, bounded, or holistic). This obligatory interpretation requires the incremental theme to be a quantity/holistic object. This is because, with a telic interpretation and an incremental theme, a

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homomorphic relationship is established, which means that the subevents of the holistic event are mapped onto the subparts of the incremental theme, hence the OTE (object-to-event) mapping (MacDonald 2008). For Filip (1997), the perfective prefix, serving as an operator/quantifier, imposes the holistic force on the object, requiring the bare NP to take the quantity reading. Again, this assumption can be assimilated into Borer's (2005b) framework if we assume that the [Quan] feature on the Asp_Q head is copied onto the bare nominal. However, Filip (1997) then points out that the perfective prefix does not require that the incremental theme be definite. That the bare object nominal in Slavic (mass nouns and bare plurals) has to take the definite reading is the presupposition of the quantity reading taken by the bare nominals. In particular, when a bare nominal is forced to take a quantity reading by the perfective operator, this quantity reading has to presuppose the existence of a 'whole bounded entity'. We can take the examples repeated below to explain this point:

(31) (a) Pil^{I} víno. (Czech)
drank-SG wine-SG-ACC
'He was drinking (the) wine.'
(b) VyPil^{I} víno. (Czech)
PERF-drank-SG wine-SG-ACC
'He drank up (all) the wine.'
Filip (1997: 2)

In (31b), the perfective marker provides the holistic function (or [Quan] feature), imposing the interpretation that the drinking event is bounded, hence a telic event. This interpretation, together with the fact that 'wine' is the incremental theme of this drinking event, entails the homomorphic relationship between the bounded drinking event and the 'wine'. The final point of the drinking event is when the final part of the wine is consumed, which means the mass interpretation of the wine must be rejected. Instead, there must be a certain quantity of wine. That is, in order to get the quantity reading, we should hold the presupposition that there is a certain quantity of wine, which is known to both the speaker and the hearer (or the hearer has to resort to presupposition accommodation to take this reading), hence the definite reading of the bare nominal *wine*. Note that while the quantity reading of *wine* is derived from the perfective marker, either the quantificational force or the [Quan] feature in Borer's (2005b) system, definiteness is required to accommodate the quantity reading. The perfective marker itself does not provide any definiteness force. This then explains the situation in (28) and (29) where the telic event has a numeral NP object that takes an indefinite reading. This line of explanation predicts that if the perfective prefix is not present, the whole entity or quantity reading of the bare nominal object is not required, which is supported by the fact presented by (31a).

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There remains a question to be addressed: if the definite reading is not from the quantification of the perfective/telic marker, then from where is it derived? Firstly, we have to know that it is a linguistic fact that Slavic (like Chinese) languages allow a bare noun, whether it is count or mass, to occur in argument positions, taking different interpretations like definite, indefinite, and generic reading. This is different from languages like English where a bare count noun cannot stay in the argument position in most cases. The syntactic structure of nominals in Slavic is naturally an important domain in syntactic studies. Two approaches are taken, divided by whether a D head is present. Borer (2005a) argues that, for all languages, there is a universal functional structure DP that involves a D head responsible for (in)definiteness and existential closure, hence making the type shifting from $\langle e, t\rangle$ to $\langle e\rangle$ possible. If this approach is taken, a bare nominal in languages like Slavic takes either a definite or indefinite reading depending on the feature of the null D head. Note that for the null D to take a definite or indefinite effect (corresponding to *the* and *a* in English) can be a pure pragmatic issue. The syntax only provides a null D, while the specific value of D can be pragmatically determined. The other approach, represented by the series studies of Bošković (Bošković 2008, 2009a, b; Bošković & Hsieh 2015), argues that there is a parameter of DP and NP languages. Slavic and Chinese belong to the NP language, which does not have a D head in the nominal structure. Abstracting away technical details, in Bošković's approach, instead of relying on a null D head, the (in)definiteness reading of a bare nominal is achieved via pure type shifting that does not have to resort to the valuation of the D feature on a certain D head. In this paper, we keep neutral to the two approaches to the nominal structure. The point crucial to our discussion is that the (in)definiteness interpretation of a bare NP in Slavic (and in Chinese) is not directly assigned by the telic feature. The linguistic system of these languages has a specific mechanism responsible for this interpretation, which is activated when interacting with the requirement of telic interpretation as discussed above.

To sum up, integrating studies in Borer (2005b) and Filip (1997), we assume the following theoretical points to be applied in the rest of this paper:

(32) (a) Telicity is the result of syntactic derivation, achieved via the feature valuation of [Quan] on the Asp_{Q} head.
(b) The [Quan] feature can be directly valued if, in a language, there is a functional item (telic marker) bearing the interpretable [Quan] feature.
(c) The telic marker can copy its [Quan] feature on to the nominal object, imposing a quantity reading to the bare nominal object.
(d) When a bare nominal is assigned a quantity reading in the telic event, it also takes a definite reading because the existence of this whole entity has to be presupposed.

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4. Accounting for the nature of *lə*

This section will explain the issues related to *lə* introduced in Section 2, with the application of theoretical elements summarised in Section 3. In particular, we will concentrate on telicity, effects on nominal objects, and past tense reading.

4.1. *lə as a telicity functional item*

Below is our first hypothesis on the nature of *lə*:

(33) The properties of *lə* (to be enriched)
  (a) *lə* is a telic marker, providing an interpretable quantity feature [*i*Quan] for the direct valuation of [Quan] feature on Asp_Q in the sense of Borer (2005b).
  (b) *lə* specifies the endpoint of an event.

The above hypothesis directly addresses an issue summarised in Section 2: *lə*-marked sentences always express a telic event. In the XS Model, telicity is the result of the valuation of the quantity feature on the Asp_Q head; if *lə* bears an [*i*Quan] feature, telic reading is obligatory in *lə*-marked sentences.

With this hypothesis, we can also explain another issue: the shift of event types denoted by activity predicates into telic events:

(34) zaŋsa sazə fəŋʤ̬oŋ lidou tae lə sa tsɔ ho.
Zhangsan 30 minute in push lə three cart goods
'Zhangsan pushed three carts of goods in 30 minutes (away to some place).'

In (34), although *tae* (to push) is not a telic predicate (as it is an activity verb), this sentence is forced to take a telic reading. This is because *lə* provides an [*i*Quan] feature to the Asp_Q head, hence requiring the event to take a quantity/holistic reading. Semantically, this is achieved because *lə* specifies the endpoint of the event, meaning that the pushing event is by no means homogeneous. Therefore, when this sentence is uttered out of the blue, 'endpoint accommodation' in the context is required. This does not mean that pragmatics determines syntax, but the other way around. Syntactic valuation of the [Quan] feature on Asp_Q requires this contextual accommodation. For example, we can imagine this context: Zhangsan's work is to push carts away to some place. With this context, the interpretation is that Zhangsan has pushed three carts away, and the endpoint of this event is when the third cart is pushed to the destination.

We can also take accomplishment verbs to further support the hypothesis:

(35) (a) ŋo ʧɛ **lə** sa ʤ̬ə biŋgo le. *dasi yi ʤ̬ə a mə ʧɛ lə.
I eat lə three CL apple le. but one CL even not eat lə
'I have eaten up three apples, *but I have not eaten up any of them.'

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(b) ŋo ʧɛ **ʤə** sa ʤ̰ə biŋgo le. dasi yi ʤ̰ə a mə ʧɛ lə.
I eat ʤ̰ə three CL apple le. but one CL even not eat lə
'I have eaten three apples, but I have not eaten up any of them.'

Both sentences have the same accomplishment verb *ʧɛ* (eat), and both involve a quantity incremental theme, *sa ʤ̰ə biŋgo* (three apples). However, only in (35a), the endpoint is invariably expressed, which is the consumption of the last bit of the three apples. This is evidenced by the fact that the second half in this example is unacceptable.

(35b), on the other hand, does not specify whether the three apples were eaten up. It only means that Zhangsan bit all three apples. He might not finish any of them. That's why the second half in this example is natural. To sum up, when *lə* is involved, the endpoint is part of the truth condition, while its absence leaves the endpoint under-specified. This is clear evidence that *lə* is syntactically/semantically responsible for telic interpretation. In our framework, this is because it is a functional item carrying the interpretable [Quan] feature, valuing the [*u*Quan] on the Asp_Q head. Without this marker, the [*u*Quan] feature will not get valued, and hence the endpoint is not semantically specified.

4.2. *Accounting for the effects of lə on objects*

In (23), we have summarised the effects of *lə* on nominal objects: first, it forces a bare NP to take a definite and quantity reading; second, it seems to force bare NPs and definite NPs to be fronted to a topic position, while a numeral NP can still stay in the post-verbal position and take indefinite reading. We will address these effects one by one below.

4.2.1. *Definite reading of bare objects*

We account for the definite effect on the bare object in a *lə*-marked sentence first. Based on the theoretical toolkit in Section 3, we postulate the following hypothesis on *lə*:

(36) The telic marker *lə*, like perfective prefixes in Slavic languages, bears an interpretable Quantity feature [*i*Quan], which can be copied onto the NP in the [Spec Asp_QP] position.

Semantic consequence: *lə* induces the holistic and boundedness interpretation of the incremental theme (Filip 1997).

The hypothesis in (36) is a straightforward application of Borer's (2005b) framework. Like Slavic languages, in Yixing there is a functional item *lə* that takes the [Quan] feature, responsible for telicity, as we have argued above. This feature can then be copied onto the NP in the [Spec Asp_QP] position via the [Spec-head]

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agreement, as is proposed in Borer (2005b). This patterns with Slavic languages, imposing a contrast with English, where there is no functional item to value the [Quan] feature on the Asp_Q head, and the feature copy is from Spec to Head, instead of Head to Spec. This explains why in Yixing, just like Slavic languages, the bare NP in the telic sentence must take a quantity reading. This is also in line with Filip's (1997) point on the holistic function of the perfective item: the perfective item derives telicity, hence holistic/bounded interpretation, which entails the holistic and boundedness interpretation of the incremental theme. A bounded entity in Borer's (2005a, 2005b) sense is a DP with a quantity feature.

Above we have accounted for the quantity reading of bare nominals in the *lə* -marked sentence in Yixing. Note that like Slavic languages, the bare nominal in telic sentences in Yixing also has to take a definite reading. We have pointed out in Section 3 that such definiteness is not directly derived from the telic functional item, hence deviating from Borer's account. We presented evidence why definiteness is not part of the feature copied from the telic marker. In Slavic languages, a numeral NP with indefinite reading can be an object of a telic sentence, which is otherwise incompatible with the telic marker if it involves a definite feature. This type of evidence is also present in Yixing, as we have seen throughout this paper. We repeat one example below:

(37) ŋo ʧɛ lə sa ʤ̩ə biŋgo.
I eat lə three CL apple
'I ate up three apples.'

Following Filip's (1997) assumption, we argue that a bare noun in a telic sentence in Yixing, just like the situation in Slavic languages, takes a definite reading because we have to presuppose the existence of this whole entity. It is also shown in Section 3 that, to fulfill this definiteness presupposition, that is, to assign a definite reading to the bare NP, we can either follow the spirit of Bošković (2008, 2009a, b), Bošković & Hsieh (2015) to claim that Yixing Chinese and Slavic languages are NP languages that lack a D feature, and definiteness is derived from a pure semantic type shifting from $\langle e, t\rangle$ to $\langle e\rangle$, or adopt Borer's (2005a) account, assuming that there is a null D that is responsible for definiteness. Both are compatible with the present analysis.

4.2.2. *'Fronting' of definite objects*

So far, we can see that the telic marker *lə* in Yixing and the perfective prefixes in Slavic languages share almost identical syntactic and semantic properties. They both denote telicity, impose a boundary on the incremental theme, and bear a relationship with the quantity reading of the bare nominal object. But there is a prominent difference in the relationship between telicity and the syntactic positions of the object NP. As we have shown in Section 2, in a *lə* -marked sentence in Yixing, the definite object and the bare object have to be fronted to the topic position, while

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the numeral NP object can stay in the post-verbal position. We repeat relevant examples below:

(38) **definite NP**

(a) *tɔ zoŋɛ ʧɛ lə **gə̰** sa ʤə̰ biŋgo le.
he yesterday eat lə these three CL apples le
Intended: 'He ate these three apples yesterday.'

(b) **gə̰** sa ʤə̰ biŋgo tɔ zoŋɛ ʧɛ lə le.
these three CL apples he yesterday eat lə le
'He ate these three apples yesterday.'

(39) **bare NP (bare plurals)**

(a) *ŋo ʧɛ lə biŋgo (le).
I eat lə apple (le)

(b) biŋgo No ʧɛ lə (le).
apple I eat lə (le)
'I have eaten up these apples.'

(40) **bare NP (mass noun)**

(a) *ŋo ʧɛ lə ʤ̰u (le).
I eat lə alcohol (le)

(b) ʤ̰u ŋo ʧɛ lə (le).
alcohol I eat lə (le)
'I have drunk up the alcohol'.

(41) **numeral NP**

ŋo ʧɛ lə sa ʤə̰ biŋgo.
I eat lə three CL apple
'I ate up three apples.'

The major hypothesis to be detailed in the rest of this section is summarised below:

(42) In addition to being a telic marker that delineates an atomic event by explicitly denoting the ending of an event, *lə* is also a **universal quantifier**, which requires a variable to be within its scope.

We will first explain why it is a reasonable hypothesis that *lə* is a universal quantifier, after which it will be shown how this aspect of *lə* provides the underlying reason for the fronting of definite and bare NPs.

In the traditional sense, quantifiers will remind people of those elements that form part of the DP or the extended projection of nominals, such as *all, every, a*, etc., in English. However, Partee (1990), based on the cross-linguistic studies of languages like Salish and Warlpiri, shows that quantifiers in different languages might take different categories, and the D category is just one possibility. A quantifier might be a predicate, an adverb, or a verbal affix, among others, which are called A-quantifiers, whose semantic effects are comparable to those of the

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D-quantifiers like *all* and *every* in English. In fact, there is already evidence that *lə* is a quantifier. In Yixing, as we have shown, it is the telic marker *lə* that provides the quantity feature, which is unlike the situation of English telic sentences, where it is the DP that provides quantity feature to the inner Asp head.

What further supports the hypothesis in (42) is that *lə* always provides the interpretation that all the members of the set denoted by the object NP are 'consumed' in the event. In the (b) sentence of (38), for example, all the three apples were eaten. For the bare NP objects in (39) and (40), the bare NP takes a definite reading that involves a certain quantity for the reason presented in the last subsection, and the interpretation is that the whole quantity is consumed. We will later show that this also patterns like another non-nominal universal quantifier (hence also an A-quantifier) in Mandarin Chinese (i.e. *dou*), which is an adverbial universal quantifier.

Following the hypothesis in (42), the object fronting restriction is reduced to the following condition:

(43) As a universal quantifier outside the nominal domain, *lə* requires a variable in its binding domain.

We argue that the crucial difference between the nominal quantifier and the A-quantifier is that the former but not the latter can always find a variable in the same nominal domain. Take the universal quantifier *every* in English, for example. Since it is part of a DP, it can always find a variable in the DP domain (for example, a variable provided by the nominal predicate). As a verbal quantifier, *lə* is not in a DP/NP domain, and in order to be a legitimate universal quantifier, it needs a variable from another source other than the DP domain. As the trace of NP movement provides a variable, it can be predicted that as long as an NP trace is within the binding domain of *lə*, the quantification requirement of *lə* would be met, making the appearance of *lə* legitimate (other things being equal). This then provides a straightforward account for the NP fronting constructions listed previously in this section. In all these examples, a trace is left due to NP movement. For example, in (38), the definite NP object 'those three apples', if in the original post-verbal object position, does not provide a variable, and hence *lə* as a universal quantifier does not have any variable to quantify over, resulting in the ungrammaticality of the sentence in (38a). After the movement of the definite object in (38b), a trace is left, serving as a variable for *lə* to quantify over. The resulting semantics is then roughly as follows:

(44) $\forall x.x \in \{\textit{those three apples}\} \rightarrow \textit{eat}(\textit{he}, x)$
'For all the x, x belongs to the set of those three apples, he has eaten x.'

Within this account, *lə* itself does not have any grammatical function to front a definite DP object (and this is why we put 'fronting' in quotation marks in the heading of this sub-section). The NP movement is enabled by other independent mechanisms available in Chinese, such as topic raising and *ba* construction, among

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others. What is required by *lə* is that it needs a variable within its binding domain. A prediction, then, is that a *lə* -marked sentence might still be legitimate if there is a variable within its binding domain which, however, is not created by NP movement. A typical situation of this scenario is the so-called *tough*-construction, where the trace is created not by DP/NP movement but by a null operator (cf. Chomsky 1977, Keine & Poole 2017, among others). The example below shows that such a scenario does legitimise *lə*:

(45) gə ʤə ʃao biŋgo ma joŋji sa fəŋʤoŋ lidou su ʧɛ *lə* ʤə gə[6].
this CL small apple very easy three minute in then eat *lə* ʤə gə
'This small apple is easy to eat within 3 minutes.'

The above example is a typical *tough*-construction, where a trace is left in the object position of the verb *ʧɛ* (to eat), and this trace is well known to be created by the movement of a null operator, which moves to the edge of the CP that is later merged with the subject. What is crucial is that, in the above example, the subject of the sentence is not moved from the object position but is base-generated in the subject position, a well-received conclusion in the literature on *tough*-constructions (see Chomsky (1977) for the original argument, and Keine & Poole (2017) for a detailed review and analysis of new arguments and debates). Following our hypothesis, this example is predicted to be grammatical because it meets the condition in (43): there is a variable in the binding domain of *lə*. Note that in this situation, the variable is created by the null operator movement, and the null operator movement is motivated independently, not related to any property of *lə*.

Now we need to further explain an issue: why can an indefinite quantity NP (i.e. the phrase in the shape of [numeral+classifier+N]) stay in the object position? According to our hypothesis, there must be a mechanism that provides a variable in the binding domain of *lə*. And this is indeed the case. Note that it is well known in the literature (Chierchia 1998, Borer 2005b) that at least in Chinese, the [numeral+classifier+N] chunk creates a nominal predicate ($\langle e, t\rangle$ type), and a nominal predicate provides a variable, which is often bound by a D element, like a nominal quantifier in the DP domain. However, without such a D element, this phrase is just a nominal predicate, which provides a variable to be quantified over. The verbal quantifier *lə*, therefore, can still find a legitimate variable to quantify over, and this explains why it is possible for an indefinite quantity NP to stay in the post-verbal object position. According to Diesing (1992), an indefinite NP can get its existential closure within the VP domain (roughly equivalent to vP in the recent tradition). In our case, if the quantity NP gets its existential closure, again we would not have a variable for *lə*. However, in the previous section we have shown that *lə* is selected and inserted in the derivation within the vP domain, which means that the indefinite quantity NP will be quantified over by *lə* before the derivation of the vP phrase is

[6] *gə* is an assertion particle in Yixing.

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completed. That is, the quantification provided by *lə* goes before the existential closure by the vP can take effect, which supports the current account.

But why do Slavic telic markers not trigger such NP fronting if they are also A-quantifiers? We assume, tentatively, that Slavic telic markers are not, by nature, universal quantifiers. Filip (1997), while showing the universal quantification semantics in some perfective sentences, does admit that not all perfective prefixes will give rise to the semantics of universal quantification. As is stated in Filip (1997), the perfective prefixes in Slavic languages actually take idiosyncratic lexical meanings not limited to universal quantificational meaning, but include distributivity and vague quantificational meaning like 'many', 'much', and 'a lot (of)', among others. Therefore, the quantificational meaning is from the idiosyncratic lexical meaning taken by the prefix instead of from an operator, which does not impose the condition requiring a variable in the binding domain. There is, in fact, evidence also in Yixing to support this assumption. What we have argued so far is that *lə*, in addition to being a telic marker, is a universal quantifier, an operator in nature. Apart from this operator, it is also possible to provide lexical meaning similar to the universal quantificational meaning. If this is the case, then in such a situation where no operator is involved, the restriction on NP fronting will not be observed. This is indeed the case. In Yixing, there are lexical particles like *wə* and *gwaŋ* (counterparts of *wan* and *guang* in Mandarin), which provide the meaning that the whole quantity is 'consumed'. On the other hand, they are not telic markers and hence do not provide a quantity feature or serve as quantifiers. The examples below show that when such particles are involved, if they do not co-occur with *lə*, the sentence does not have a telic effect, and they do not have an object fronting effect:

(46) (a) ŋo ʧɛ wə **ʤə̰** gə̰ sa ʤə̰ biŋgo le.
I eat finish ʤə̰ these three CL apple le
'I have eaten these three apples.'

(b) zaŋsa ʧɛ gwaŋ **ʤə̰** gə̰ sa bae kafi le.
Zhangsan eat finish **ʤə̰** these three CL coffee le
'Zhangsan has drunk up those three cups of coffee.'

The above examples are evidence that apart from universal quantifiers, there are also other non-operator elements that can provide lexical meaning of finishing or completion. Not being a universal quantifier, items like *wə* and *gwaŋ* do not submit to the condition in (43). Additionally, such items do not share the other effects imposed by *lə* discussed in this paper. The Slavic perfective prefixes, while sharing the telic nature with *lə* in Yixing, are not, by nature, universal quantifiers. Instead, such prefixes provide idiosyncratic meanings with only some patterning like universal quantificational meanings. *lə* in Yixing, on the other hand, consistently provides the universal quantificational semantics, and we argue that it is indeed a universal quantifier.

Before proceeding, we address an issue regarding the assumption on variable binding proposed in this section. The current approach, as pointed out by a

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reviewer, seems to have the potential to violate the Bijection Principle (BP) by Koopman & Dominique (1982), as a variable in this account is bound by both the NP moved to the topic position and the universal quantifier. We would like to show that this situation presented in our paper does not pose a threat regarding the violation of BP. BP is proposed to account for the issue of crossover, which states that there is bijective correspondence between an A-bar operator and a variable. The gist of BP is that an A-bar operator should only bind one variable, and a variable should only be bound by one A-bar operator. BP, regardless of whether it is rejected or not in the later research (cf. Safir (1983)), does not impose a restriction on the non-A-bar operator and the variable. For example, it does not apply to A-operators, which can bind more than one variable. Returning to our situation, the variable is only bound by one A-bar operator (the NP in the topic position), while the other operator, the universal quantifier, is not an A-bar operator.

In fact, a variable bound by both an A-bar operator and a quantifier is not uncommon, as the following examples in English show:

(47) (a) Which scientists$_i$ t_i have **all** gone to the UK?
(b) Those apples$_i$, they have eaten **all** of them$_i$.

In (47a), the variable created by the *wh*-movement is bound both by the *wh*-phrase and the universal quantifier *all.* In (47b), which is a topic construction, the pronoun *them* is bound by the topic DP as well as the universal quantifier *all.* In fact, McCloskey (2000) provides a syntactic analysis of such data that involve a *wh*-movement and a quantifier, further showing that this type of phenomenon is a linguistic fact that is attested cross-linguistically.

While there is no BP violation problem, it is a general issue as to how a variable is bound by both an antecedent and a quantifier. As far as we know, there is no formal account for this phenomenon (McCloskey (2000) mainly focuses on the syntactic structure, without explaining how the variable-binding relationship is realised). Providing a detailed account for this general issue is beyond the scope of this paper. What is relevant to the current purpose is the fact that a variable can be bound by an antecedent and a quantifier.

Below we present an initial analysis of the analogy between *lə* quantification and the quantification of *dou* in Mandarin Chinese, which further supports the hypothesis that *lə* is a universal quantifier. *dou* in Mandarin is often taken as a universal quantifier (cf. Lee 1986, Lin 1998, Pan 2006, among others), and since it is not within the DP domain (often taken as an adverbial item), it is also an A-quantifier. It would therefore be predicted that it will impose the same requirement: requiring a variable in its binding domain. This is indeed the case. The NP quantified over by *dou* is always fronted to the left side of *dou*, and following the current analysis, this is because a variable is required:

(48) (a) na san ge pingguo ta **dou** chi le.
that three CL apple he **dou** eat le
'He has eaten all those three apples.'

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(b) *ta **dou** chi le na san ge pingguo.
he **dou** eat le that three CL apple
Intended: 'He has eaten all those three apples.'

Following our hypothesis, this universal quantifier, *dou*, which is not in the DP domain, also submits to the condition in (43); that is, it needs a variable to be within its binding domain. DP/NP movement, motivated by whatever mechanism in the grammatical system, can provide a variable, as indicated by the above example in (48a). Also, (48b) shows that, without such a variable, the sentence will be ungrammatical, reminiscent of our case in *lə*-marked sentences.

If our hypothesis is correct, then we would also predict that the NP movement is not triggered by *dou* itself, and other scenarios where a variable is created not by NP movement can also be legitimate in a *dou* sentence. Here again, the *tough*-construction kicks in:

(49) Zhe xie ren **dou** hen nan shuofu.
This some people **dou** very difficult persuade
'These people are all difficult to persuade.'

Here, just like the case in (45), a variable is created in the post-verbal object position, not because of NP movement, but due to null operator movement, while the subject is base-generated. This variable is quantified over by the adverbial universal quantifier *dou*, making the latter legitimate. There is, however, one difference between the restriction of *lə* and *dou*. Recall that for *lə*, it is possible for an indefinite numeral NP to stay in the post-verbal object position. This is impossible for *dou*:

(50) (a) san ge pingguo ta **dou** chi le.[7]
three CL apple he **dou** eat le
'He has eaten all the three apples.'
(b) *ta **dou** chi le san ge pingguo.
he **dou** eat le three CL apple
intended: 'He has eaten all three apples.[8]

The ungrammaticality of the above sentence supports our account. It was argued above that indefinite quantity NPs are possible in the post-verbal position in *lə* -marked sentences because such phrases are, by nature, nominal predicates, which provide a variable to be quantified over by *lə*. The variable provided by the

[7] As pointed out by one reviewer, actually when the numeral NP is fronted, it has to be known in the context, meaning it is definite. That being said, the contrast between *dou*- and *lə*- marked sentences, which is relevant to the present analysis, is still there: *dou* does not even allow a numeral NP to appear in its quantifying scope, which is the point we want to highlight here. See Wu (2017) for a discussion of the definiteness of numeral NPs in Chinese.

[8] This sentence will be grammatical if *dou* does not serve as a universal quantifier that quantifies over the object, but takes the meaning of 'even', an issue not relevant here.

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indefinite NP can be quantified over by *lə* because the quantification of *lə* goes before the existential closure can be provided by vP. In the case of *dou*, since this universal quantifier, as an adverbial item, is outside the vP domain (or merged with vP as an adjunct in the stage of late-insertion), the vP existential closure will quantify over the variable before *dou* can take effect. Therefore, when the indefinite NP is in the post-verbal object position, *dou* does not have a variable to quantify over, and movement, among others, is one way out to create a variable for *dou.*

A reviewer raises an issue regarding the involvement of *shenme* in *dou*-marked sentences presented below:

(51) (a) Zhangsan **dou** chi le shenme?
Zhangsan **dou** eat Perf. SHENME
'What are those things that are all eaten by Zhangsan?'
(b) Zhangsan shenme **dou** chi.
Zhangsan SHENME **dou** eat
'For all the things X, Zhangsan will eat X'.

The interesting issue is that when *shenme* is in the object position, a *wh*-question reading is derived, but when the same object *shenme* is placed in the pre-verbal position, the question reading is impossible. Following Tsai (1994), *shenme* in Chinese is not a *wh*-word like *what* in English, but a variable that can be unselectively bound by accessible operators. What is crucial in Tsai's analysis is that the question operator (Q-operator) is null, which is attached in the C position, and is hence an A-bar operator. Since *dou* is in the vP domain, which then is not in an A-bar position, it is an A operator. As shown above, there is empirical evidence that a variable can be bound both by an A-bar operator and an A operator, and it is not against the BP. In (51a), the variable *shenme* is bound by the Q-operator to give rise to the question reading, and it is bound by the universal quantifier *dou* which gives the 'all' reading.

In (51b), the *wh*-question reading is not accessible, and the reason is that *shenme* is moved to a topic position (Chinese can have multiple topics), which then serves as an A-bar operator to bind its trace. This means that this trace can no longer be bound by an even higher Q-operator because the Q-operator is also an A-bar operator, and having two A-bar operators for a single variable is against BP. Of course we can also take Chomsky's (1977) analysis of *tough*-constructions to assume that *shenme* is base-generated in this topic position; a null operator moves from the object position to the edge of the embedded CP, and the trace left by the movement creates a variable. But the result is the same: the variable is bound by an A-bar operator (the null operator in the edge of the embedded CP, which co-refers with the antecedent *shenme*), which blocks the accessibility of a higher Q-operator due to BP restriction. While providing this sketchy analysis, we have to emphasise that both *dou* and *shenme* are famously complicated topics in Chinese linguistics. However, we show that at least for the typical use of *dou* as a universal quantifier, it patterns like that of *lə* in Yixing. This analogy, in a sense, supports our hypothesis proposed in this

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section and further supports the assumption regarding A-quantifiers in Partee (1990) and Filip (1997). While there might be alternatives to the account proposed in this subsection, it seems to be reasonable to assume that the object fronting of *lə* -marked sentences and *dou* sentences share the same underlying mechanism, which is reduced to the nature of the A-quantifier style of the universal quantifiers, verbal for *lə* and adverbial for *dou.*

Before ending this section, a caveat is presented[9]. At this point, it is clear that *lə*, in addition to its grammatical functions like telic marking, has some idiosyncratic semantic content, denoting the meaning that the object is completely consumed, indicating that the object will disappear at the endpoint. This property of *lə* is not surprising in the context of Chinese grammar wherein most functional items also take idiosyncratic content. That is why functional items in Chinese are called semi-functional items in Huang's (2014) recent work on the analyticity of Chinese syntax. We should then ask a question like this: what if a telic event is to be expressed, but there is no reading such that the object (theme) disappears at the endpoint? Obviously, other ways to derive telicity have to be employed. In Borer (2005b: Chpater 12), it is argued that goal PPs and particles (like *over* in *take over* and *up* in *stand up*) can also assign a range to the quantity head (Asp_Q head). It would then be predicted that such ways in Yixing can be taken to provide telic (quantity) feature as a last resort when there is no complete consumption and disappearance involved in the telic event. This prediction does hold. The following examples are both telic, but neither involves *lə*. The first one takes a goal PP, and the second one takes a particle (roughly equivalent to *up* in English):

(52) (a) zaŋsa zə fəŋʤ̩oŋ lidou su bao dao wɔdəŋ.
Zhangsan ten minite in then run to school
'Zhangsan ran to school in 10 minutes.'

(b) gə bae ʃy zə fəŋʤ̩oŋ lidou su b̥iŋ ʧi-lae ʤ̩ə le.
This cup water 10 minute in then freeze up ʤ̩ə le
'This cup of water froze in 10 minutes.'

In (52a), it is PP that provides the telic feature (following Borer's account), and *lə* is not required. A question can be asked: without PP, can *lə* be attached to the verb in this example to derive telic reading? The answer is no, and the reason is related to the semantic content of *lə*: *lə* expresses the reading that the endpoint is the 'disappearance' of the theme argument (such as via consumption or other forms of disappearance), while reaching a location like the case in the above example is not compatible with this reading. This also applies to the *freeze* example. Since the water only changes its form but does not disappear, *lə* is not compatible with this verb. To express the change of state, the particle *ʧi-lae*, which is the counterpart of *qi-lai* (roughly meaning *rise* and *up*) in Mandarin, has to be used. This also explains in general why unergative verbs are not compatible with *lə*. Since *lə* denotes the

[9] This part is inspired by the reviewer's comment.

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semantic content that the entity is completely 'consumed' and hence disappears, events involving an unergative verb will not be compatible with *lə* because there is no theme argument involved, not to mention an entity that is completely 'consumed'. This is shown by the following examples:

(53) (a) zaŋsa ʃao ***lə/ʤə** le.
Zhangsan smile lə/ʤə le
Intended: 'Zhangsan (has) smiled.'
(b) zaŋsa bao ***lə/ʤə** le.
Zhangsan run lə/ʤə le
Intended: 'Zhangsan ran/has run.'

In both examples that involve unergative verbs (*ʃao* (smile) and *bao* (run)), the sentence becomes ungrammatical as long as *lə* is involved.

By arguing that *lə* takes some idiosyncratic content that denotes the meaning of complete consumption, we might face this question, as is raised by both reviewers: is *lə* actually a secondary predicate like the particle *wan* (finish) in Mandarin, which, together with the matrix verb, forms a complex predicate (i.e. the resultative verb compound (RVC)) as is put in Sybesma (1997, 2017)? There are reasons to argue against this possibility. First, in Yixing, there are items corresponding to particles like *wan* (finish). Even when such particles are attached to the verb, as shown by the example below, still *lə* is obligatorily required for the expression of telicity, showing that it is *lə* that is responsible for the syntactic encoding of telicity. Also, if *lə* is really the resultative predicate that is mainly responsible for denoting semantics of 'fishing' or 'completion' which is also expressed by *wə* (counterpart of *wan* in Mandarin), then we would not expect it to co-occur with *wə*. But the following example shows that they can co-occur, and actually to express telicity, even when *wə* is attached to the verb, the presence of *lə* is obligatory. This clearly shows that *lə* and particles like *wə* have different grammatical functions and hence are inserted in different positions in the structure.

(54) zaŋsa sazə fəŋʤoŋ lidou ʃɛ wə *(*lə*) sa foŋ ʃiŋ.
Zhangsan thirty minute in write finish lə three CL letter
'Zhangsan finished writing three letters in thirty minutes.'

Secondly, as shown throughout this paper, apart from the function of marking telicity, *lə* presents some special grammatical functions like the special effect on the object NP (like NP fronting) and temporal denoting in the sense of perfective aspect. Neither is exhibited by resultative secondary predicates like the Mandarin *wan* or its Yixing counterpart *wə* in the RVC. Therefore, we conclude that despite the possible historical relationship between *lə* and the resultative predicate, at the synchronic level, *lə* has developed into a functional item, although it still retains some idiosyncratic content which seems to be common to functional items in Chinese in general.

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4.3. *lə and perfective aspect*

As described in Section 2, when *lə* occurs in a single clause, a past event reading is expressed, seeming to indicate that *lə* serves as a past tense marker. Moreover, *lə* seems to be impossible to occur in a clause that expresses either a habitual event or a future event. We repeat the relevant examples below:

(55) (a) zaŋsa ʧɛ lə ji bae kafi.
Zhangsan eat lə a CL coffee
'Zhangsan drunk up a cup of coffee.'

(b) *zaŋsa **maetie** ʧɛ lə ji bae kafi.
Zhangsan everyday eat lə a CL coffee
Intended: 'Zhangsan drinks up a cup of coffee every day.'

(c) *zaŋsa **miŋzao** yao ʧɛ lə sa bae kafi.
Zhangsan tomorrow will eat lə three CL coffee
Intended: 'Tomorrow Zhangsan will drink up three coffees.'

Such data might easily lead us to assume that *lə* also takes a past tense feature that imposes an uncancellable past tense reading. However, a closer scrutiny at more data shows that the above phenomenon is not related to a tense marker, but concerns reference time:

(56) (a) zaŋsa maetie **ʤ̩u ʤ̩jezoŋ** jiʤ̩iŋ iʧɛ lə sa bae kafi.
Zhangsan everyday nine o'clock already eat lə three CL coffee
'Zhangsan will have drunk up three cups of coffee at 9 o'clock everyday.'

(b) zaŋsa **miŋzao** ʤ̩u ʤ̩jezoŋ konəŋ jiʤ̩iŋ ʧɛ lə sa bae kafi.
Zhangsan tomorrow nine o'clock possible already eat lə three CL coffee
'Tomorrow Zhangsan will have possibly drunk up three coffees at nine o'clock.'

The above examples show that as long as there is explicit reference point and this point is preceded by the event time, then the event time of the *lə* -marked sentence does not have to be past. Since the relationship between the reference time and event time is exactly related to the outer aspect, it is natural, therefore, to assume that *lə*, in addition to the telicity/quantity feature, also bears an outer aspectual feature. And this is exactly the hypothesis to be proposed in this section. We assume that in addition to the quantity/telic feature, *lə* also bears a perfective feature, which then serves as a relative tense marker as proposed by Lin (2000, 2003, 2007) in the seminal study on the verbal *le* in Mandarin Chinese. We will return to the difference between Yixing *lə* and the Mandarin *le* later in this section. The crucial property of the perfective marker is that the event expressed by the sentence is within the reference time, and therefore the event is taken as a complete

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whole (cf. Smith 1997; Lin 2000, 2003, 2007; Demirdache & Uribe-Etxebarria 2014). This alone does not necessarily entail that a *lə* -marked sentence is forced to denote a past tense reading. What also plays a role in the derivation of the past tense reading is that the speech time is taken as reference time by default. Hence we have the following summary:

(57) a. In addition to telic/quantity feature, *lə* bears a perfective feature.
b. In Yixing, just like the case in Mandarin Chinese, as proposed in Lin (2000, 2003, 2007, 2017), speech time is taken as reference time by default.

It then follows that, in the absence of an explicitly expressed reference time, a *lə* -marked sentence always expresses an event that is within the speech time taken as default reference time. Here we see that the dual-feature property of *lə* gives it two functions: it is responsible for the encoding of a telic event, and it is responsible for the viewpoint over the event. Because the event in a *lə* -marked sentence is telic, it is an atomic entity like a count noun. A special property of the atomic entity is that no sub-part of this entity is also the same entity, just as a part of an apple in itself is not an apple. This is crucial in the past tense reading of an event in the *lə* -marked sentence. The endpoint of this event must be within the reference time because it is situated by the perfective aspect, which encodes the viewpoint reading such that the event is within the reference time. If the default reference time is speech time, it means that the endpoint of the event is within the speech time, which then gives rise to the past tense reading[10]. This can be summarised as follows:

(58) Let *e* be the event in a *lə* -marked clause, considering *lə* bears a telic feature and perfective feature:
a. **Reading imposed by the telic feature**: *e* has an endpoint, and no subpart of *e* is also *e*.
b. **Reading imposed by the perfective feature**: the event time of *e* must be within the reference time, and therefore the endpoint of *e* must be within the reference time.
c. **By default**: reference time= speech time
d. **Interpretation by default**: the event's endpoint is within the speech time, hence past tense reading.

We can take examples in (55) to illustrate the above points. In (55a), without a specific reference time, the speech time is taken as reference time by default. This means that the final point of the drinking of a cup of coffee must take place within the speech time, hence a past tense reading. We may then ask why can we not just

[10] It should be noted here that speech time and other reference time (or assertion time) are temporal intervals, not temporal points (cf. Demirdache & Uribe-Etxebarria (2000, 2014)), so if an atomic/telic event is within the speech time, it means that the endpoint of this event must be included in the speech time interval, which then gives rise to the past tense reading.

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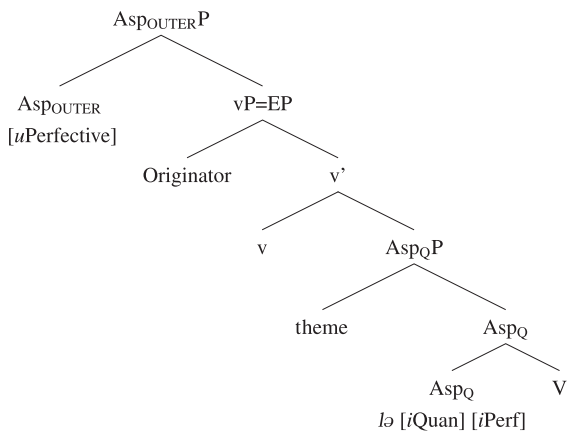
use the same default reference time to make (55b) acceptable? The problem lies in 'every day'. A habitual sentence obviously cannot take a specific speech time as reference time, and without a legitimate reference time, this sentence is unacceptable. The same logic applies to (55c). Again, in this sentence there is no explicitly expressed reference time, and the default reference time (i.e. the speech time) is the only choice. By taking speech time as the reference time, a semantic conflict will arise: the perfective reading plus the speech time as the reference time will blindly return a past tense reading, but the adverbial *miŋzao* (tomorrow) explicitly shows that the event will take place in the future. This obvious semantic conflict cannot be resolved, leading to the unacceptability of this sentence.

The syntactic structure involving *lə* is therefore as follows:

(59)



In the above structure, $\text{Asp}_{\text{OUTER}}$ is the functional head responsible for the perfective aspect, which is above vP. The [*i*Quan] feature on *lə* will value the corresponding feature to yield telicity. In addition, the [*u*Perf] on the $\text{Asp}_{\text{OUTER}}$ needs to be valued, which is achieved via the valuation still provided by *lə* due to its additional [*i*Perf] feature.

If this analysis is on the right track, it can be predicted that, as long as a legitimate reference time is provided, the sentences in (55) will be saved. This is indeed the case as shown in (56). In both (56a) and (56b), the specific time 9 o'clock indicates that the reference time is a temporal span with 9 o'clock as the endpoint. In (56a), the reading is that the endpoint of drinking a cup of coffee occurs before or exactly at 9 o'clock everyday, a reading that is not past tense. In (56b), the reading is that the endpoint of his drinking a cup of coffee will occur before or exactly at 9 o'clock tomorrow, again not a past tense reading.

So far, the perfective reading of *lə* is exactly like what Lin (2000, 2003, 2007, 2017) has proposed for the interpretation of verbal *le* in Mandarin Chinese.

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However, there is a difference. As Lin (2017) shows, the verbal *le*-marked sentence in Mandarin can also express a present tense:

(60) Zhangsan yang **le** san zhi tuzi.
Zhangsan raise Perf. three CL rabbit
'Zhangsan raises three rabbits.'

This is because, as Lin (2017) argues, *le* is a perfective marker which only requires one of the events expressed by the vP to be within the reference time. Since the event of raising rabbits is not a telic event, a subpart of it is also of the same event. Therefore we can have the reading that one subevent of rabbit raising is within the reference time (i.e. the speech time by default), while other subparts of this event, which are also rabbit raising events, can continue, hence the expression of the present tense reading. This analysis in fact indicates that *lə* in Yixing cannot occur in such sentences. This is because the predicate *jaŋ* ('to raise') is not compatible with a telic reading, but *lə* forces a telic reading due to its telic (quantity) feature, which *le* in Mandarin does not bear. This is indeed the case:

(61) *zaŋsa jaŋ lə sa ʤə̰ tuʤə̰.
Zhangsan raise lə three CL rabbit

The above example indicates an important fact regarding the comparison between Mandarin *le* and Yixing *lə*: the two particles have the same perfective feature but differ in that the latter bears a telic feature. This explains why the two look quite similar when we focus on the interpretation of perfective reading. The Mandarin *le*, however, does not obligatorily express telic reading, nor does it exhibit those restrictions of *lə* like object fronting. And this is due to the lack of telic feature.

5. Implications and conclusion

In this paper, we start from the similarity between the Slavic perfective prefix and *lə* in Yixing. Both are responsible for telic reading. This fact can be explained by Borer's (2005b) assumption that there is an Asp_Q head in the vP domain that is responsible for the quantity feature valuation and hence the telic reading. *lə* is assumed to take the quantity feature, as is the case for Slavic perfective prefixes proposed in Borer's original account. An implication, therefore, can be gained on the parameters of telicity, which can be determined by whether there are functional items that bear a quantity feature in the lexicon.

Apart from the aforementioned similarity, differences exist between the telic items of these two languages. In Yixing, *lə* also imposes a constraint to front a definite and bare NP to a topic position. In this paper, we show that this is due to the fact that *lə* functions as a verbal quantifier, which is a universal quantifier that requires a variable in its quantificational/binding domain. The definite NP and bare NP are fronted in *lə* -marked sentences because the NP/DP movement leaves a trace, and hence a variable, to be quantified over by *lə*, the universal quantifier. Thus our

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analysis strengthens the assumption by Partee (1990) and Filip (1997) that there are quantifiers (A-quantifiers) out of the nominal domain, although what quantificational force is taken by the A-quantifier might vary cross-linguistically.

Another special property of *lə*, as argued in this paper, is that it takes a perfective aspect feature, responsible for the perfective aspect reading of a telic event. This explains why a *lə* -marked sentence often expresses a past event and why such a sentence can also express perfective aspect reading of an event of another type (i.e. that of habitual and future events), as long as a legitimate reference time is specified in the clause. This indicates the possibility of extending the temporal semantics of a certain temporal head. The inner aspect (telicity), outer aspect, and tense, as argued in Demirdache & Uribe-Etxebarria (2000) and Stowell (2007), among others, are all functional heads denoting the relationship of temporal entities like reference time, speech time, and event time. Therefore, it is natural that a temporal head like the telic head might also climb up to express more temporal information, such as aspectual information. We hope that more evidence can be found to verify this possibility cross-linguistically.

A possible direction for future studies is to see whether a particle like *lə* in Yixing is also attested in other dialects of Chinese, which could lend empirical support to the analysis in this paper. In fact, Ma (1983) pointed out that the Mandarin *le* also corresponds to two items in Beijing dialect, *le* and *lou*, the latter expressing the meaning of finishing. This is much like the behaviour of *lə* in Yixing, although Ma (1983) did not relate it to telicity. It is therefore intriguing to investigate whether *lou* also exhibits those properties of *lə* analysed in this paper. Recently, our investigation of Chinese Wenzhou dialect reveals that the particle *ɦɔ* in this dialect exhibits many crucial properties of *lə* presented in this paper. This further indicates that the mechanism of telic and perfective marking, as well as the related universal quantification, is not a rare thing, at least in Chinese varieties.

Finally, due to space limitation, in this paper we did not delve into a detailed comparison between Yixing and Mandarin. It is a notoriously difficult issue regarding the nature of verbal *le* in Mandarin, which has inspired researchers to propose various explanations (cf. Smith (1997), Lin (2000, 2003, 2007, 2017), and Soh & Gao (2007), among others), all attempting to provide a unified account for the syntactic nature of *le*. However, when comparing Yixing with Mandarin, we find that *lə* and *ʟ̥ə* both correspond to the verbal *le* in Mandarin. This indicates that the verbal *le* in Mandarin is not homogeneous, and it involves at least two separate functions taken by *lə* and *ʟ̥ə* in Yixing. If this is the case, two possibilities might come to mind: (a) there are indeed two verbal *le*s in Mandarin, corresponding to *lə* and *ʟ̥ə* in Yixing, and they happen to take the same phonological form; (b) there were two verbal *le*s in history, but due to their identical phonological forms, the two have been reanalysed as a single functional item that bears the features of *lə* and *ʟ̥ə* in Yixing. Following this assumption, it can be hypothesised that these features are realised in different syntactic contexts, which is technically possible following the recent studies on contextual allosemy in Marantz (2013) and Wood & Marantz (2017). In this paper, we did not explore either possibility, but only indicated that

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Yixing data and our analysis reported in this paper could indeed provide important implications to the research on the verbal *le* in Mandarin. Even if researchers do not agree with our hypotheses developed in this paper, the two phonologically different items in one dialect, both corresponding to the verbal *le* in Mandarin, should be taken as a new empirical ground to rethink this complex issue.

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