

# Chapter 16

## Functional items, lexical information, and telicity: A parameter hierarchy-based approach to the telicity parameter

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This paper attempts to present an account for the parameters of telicity based on data from Yixing Chinese, a variety of Chinese Wu dialect, as well as well-studied languages like English and Slavic languages. It is argued that the cross-linguistic variation of telicity is reduced to two factors of a lexicon: whether a language has a functional item bearing a telic (quantity) feature, and whether the telic functional item also bears extra semantic information entailing the measuring up point of the event. These two factors determine the following properties of a language: in English and other Germanic languages, without a telic functional item, telicity often relies on quantity objects, and a quantity object often forces telic interpretation to be derived; in Slavic languages and Chinese (Mandarin, Yixing and perhaps other dialects) wherein telic functional items are available, telicity does not rely on quantity objects but on the functional item, which imposes quantification over bare nominals. Slavic languages differ from Chinese in that their telic items also bear semantic information entailing the measuring up point of an event, so the endpoint of a telic event is invariably identified with its measuring up point, while such information is only a piece of cancellable default meaning in Chinese.

### 1 Introduction

This paper studies the syntactic variation of inner aspect, which is concerned with the internal temporal structure of an event, as opposed to outer aspect



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(Travis 1991: 7) that denotes the speaker's point of view over the event (Smith 1997). While outer aspect is uniformly taken as a syntactic object realised by a functional head (Asp head) in the syntactic tree of the Chomskyan tradition, ever since Vendler's (1957) work, inner aspect has been widely taken as part of lexical information, characterised by the classification of the accomplishment, achievement, activity, and state predicates. However, recently, researchers like Borer (2005a,b; 2013), MacDonald (2008) and Travis (2010) come to the conclusion that inner aspect, like outer aspect, is also an interpretation derived from syntactic computation, instead of being a piece of lexical information. In this paper, drawing on new data from a Chinese dialect, Yixing, I take up this assumption, especially that of Borer (2005a,b; 2013), to further investigate the underlying mechanism leading to the cross-linguistic variation of inner aspect.

Variation concerning inner aspect, especially telicity, has been widely discussed in Filip (1997; 2000), Filip & Rothstein (2000), Borer (2005a,b), MacDonald (2008), and Travis (2010), among many others. This paper, drawing upon data from Yixing Chinese described in Hu (2016), places Chinese within the broad picture of comparative study on telicity, and shows that variation of telicity hinges upon the (un)availability of a functional item bearing a telic (quantity) feature in the lexicon, and further variation will arise due to extra semantic flavours of the functional item. This paper, therefore, not only contributes new data to the debate on the nature of telicity, but also provides a new account for the variation of telicity in the manner of hierarchy of parameters proposed in Roberts (2010).

The rest of this paper is organised as follows. §2 presents a sketchy introduction to telicity related notions and issues in English and Slavic languages that have been covered in the recent study of telicity and its variation. §3 will present a summary of two approaches to the cross-linguistic variation of telicity, and §4, with the presentation of the data from Yixing Chinese, brings Chinese into the picture of the telicity variation. Based on the data and framework outlined in the previous sections, in §5 I explain the underlying mechanisms that govern the variation on telicity, and work out a hierarchy of parameters of telicity. §6 concludes the paper.

## 2 Inner aspect and variation: The facts

### 2.1 Inner aspect: A short introduction

Inner aspect, also termed as *aktionsart* and *lexical aspect*, is not about how the language user views an event, but about the internal structure, temporal structure in particular, of an event. Whether an event is expressed as having an endpoint is

at the centre: an event with an endpoint is assumed to be telic, otherwise atelic. It should be noted that telicity is not about the reality, but is a piece of information expressed linguistically:

- (1) a. John ate an apple in 5 minutes.  
b. John ate apples for 10 minutes.

(1a) is telic: the endpoint of the eating event was the point when the last bit of the apple was consumed. (1b) is atelic, as the endpoint is not expressed linguistically – we only know from the sentence that within 10 minutes, John had been eating apples. While in reality there will be an endpoint of the event of John's eating apples, this information is not expressed by the sentence.

If we only take English data to explore the nature of inner aspect, two factors are at stake in determining telicity. The first concerns the verb types in terms of Vendler's (1957) classification. Telicity in English often goes with achievement and accomplishment predicates, and it is quite hard to express a telic event if the predicate is of the activity or state type (but see later that under certain circumstances, telicity will also arise with such predicates).

- (2) a. John reached the summit at 9 pm.  
b. John drank a bottle of beer in 10 minutes.  
c. John pushed the cart for/\*in 10 minutes.  
d. Mary stayed in London for/\*in 10 days.

In the above examples, *reach* is an achievement predicate which denotes a change of state at a single temporal point – the initial and the final points share the same point, i.e. 9 pm in (2a). *drink* is an accomplishment predicate which in (2b) denotes an event that spans a period of time: the initial point was when John began to drink the beer while the endpoint was when the final drop of the beer was consumed. In (2c) and (2d), no endpoint is expressed, which is confirmed by the incompatibility with the *in x time* adverbial, a standard diagnostic of telicity. Following Dowty (1991) and Rothstein (2004), the predicates that allow for telicity take the internal argument as an “incremental theme”, which is an argument that seems to measure up the event, representing a homomorphic mapping between the argument and the event. For example, *a glass of beer* is an incremental theme in (2b): there is a one-to-one homomorphic mapping between the glass of wine and the drinking event: the consumption of the last drop of the wine signals the endpoint of the drinking event. It is in this sense that predicates like *drink* are

termed as homomorphic predicates (Krifka 1992; 1998; Filip 1997), which include both accomplishment and achievement predicates.

The second factor concerns the internal argument. An accomplishment or achievement predicate does not guarantee the telicity of an event: often a quantised or quantity object (Krifka 1992; 1998; Borer 2005a,b) is needed. Consider the following examples:

- (3) a. John drank water \*in 5 minutes.
- b. John built houses \*in 2 months.

In addition to the aforementioned factors, sometimes a directional PP can also affect telicity: while an activity predicate normally does not allow for telic interpretation, the addition of a directional PP can contribute to the telic interpretation:

- (4) a. John pushed the cart \*in 10 minutes.
- b. John pushed the cart *to the wall* in 10 minutes.

It is clear that it is the PP *to the wall* that makes the telic interpretation legitimate. Without taking any theoretical stance for now, we can say that the function of PP is to provide an endpoint to the pushing event.

Relying on English data, we can draw a conclusion that telicity connects with multiple facets: the predicate type (at the level of verbal head, or simply a matter of lexical information), the quantity of nominal objects (NP or DP level, definitely not a matter of lexical information), and the function of the directional PP (VP level). Whatever approach we take, one point is for sure: telicity is by no means a matter solely confined to the domain of lexical information.

Another conclusion derived from English data is that telicity (or inner aspect) in English, unlike outer aspect, is not represented by morphological marking: there is no grammatical marker to yield telicity; but outer aspect clearly represents morphological marking – the progressive aspect is reflected by the *ing* marking on the verb, for example.

In the next section, I will show that in some languages, telicity of an event is not determined equally by the aforementioned factors; moreover, there is morphological marking directly related to telicity. The existence of such phenomena makes the variation of telicity an interesting research topic, which constitutes the central topic of this paper.

## 2.2 Telicity in Slavic languages

Slavic languages are often taken as the major source showing the variation of telicity (but see Travis 2010 for more languages). Two points of Slavic languages are at stake. First, when a telic event is expressed, a perfective prefix is attached to the verb. The following Russian examples exhibit this point:

(5) Russian (MacDonald 2008: 146)

- a. Ja vypil butylku vina za čas / \*v tečeniji časa.  
I drank-*PFV* a-bottle of-wine in hour during hour  
'I drank a bottle of wine in an hour / \*for an hour.'
- b. Mary pročital knigu za čas / \*v tečeniji časa.  
Mary read-*PFV* a-book in hour during hour  
'Mary read a book/poetry in an hour / \*for an hour.'

Recall 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:

(6) Russian (MacDonald 2008: 146)

- a. Ja pil butylku vina \*za čas / v tečeniji časa.  
I drank-*IPFV* 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-*IPFV* a book in hour during hour  
'Mary read a book \*in an hour / for an hour.'

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

(7) Russian (MacDonald 2008: 148)

- a. Fermer tasčil brevno v ambar \*za čas / v tečeniji časa.  
The farmer dragged-*IPFV* the log into the barn in hour during hour  
'The farmer dragged the log into the barn \*in an hour / for an hour.'
- b. Ptisi leteli k kletke \*za čas / v tečeniji časa.  
The birds flew-*IPFV* toward their cage in hour during hour  
'The birds flew toward their cage \*in an hour / for an hour.'

While there are more telicity related properties in Slavic languages which I will introduce in the course of discussion, now we can already see some aspects of variation of telicity: in Slavic languages, telicity is morphologically realised, thus unlike English which only relies on the quantity theme and the predicate type (and sometimes directional PPs). This variation provides clues as to the nature of telicity, and presents specific issues for the investigation of the mechanism underlying the variation of telicity.

### 3 Approaches to variation of telicity

#### 3.1 The lexicalist approach

Abstracting away technical details, two strands of analysis are proposed on the variation of telicity, one being a lexicalist approach (Filip 2005; Filip & Rothstein 2000) and the other syntactic type (Borer 2005a,b; MacDonald 2008; Travis 2010). In this section, I present a brief summary of the lexicalist approach. The lexicalist approach to telicity is characterised by the central assumption that telic reading is derived not via the valuation of a feature specified on a functional head, but from the lexical information of the predicate.

According to Filip (2005); Filip & Rothstein (2000), telicity arises because a maximalisation operator  $Max_E$  applies at the denotation of the predicate of an event. This operator maps sets of events denoted by the predicate onto sets of maximal events, i.e. telic events. Take English for example. An accomplishment verb like *eat* denotes a set of events, the stages of which are qualitatively the same. In order to get a maximal eating event to be achieved when  $Max_E$  applies, an externally given scale is needed to which an event is maximal. In the case of *eating*, the referent of the internal argument (such as *an apple* in *eat an apple*) serves as the external scale, as when this scale is taken into consideration, the stages of the eating event will be different, and  $Max_E$  will pick out the maximal event of eating the whole apple.

Based on the assumption of the maximalisation operator  $Max_E$ , Filip & Rothstein (2000) further argue that the cross-linguistic variation concerning telicity happens because  $Max_E$  applies at different levels across languages. In particular, in Germanic languages,  $Max_E$  applies at the VP level, which means that the composition of the semantics of the verb and the object plays a central role in determining telicity, as is shown in the case of *eat three apples*. Any information in the VP domain will be taken as resources for  $Max_E$  to apply. The direct object plays a role because it is legitimate to be taken as the external scale. The lexical meaning of the verb also plays a role because in most cases only incremental

verbs can denote an event that can take the internal argument as its external scale. That's why *eat an apple* can be taken to denote a telic event, while *carry an apple* denotes an atelic event. In Slavic languages, the  $\text{Max}_E$  operator applies at the verbal level. Therefore, only lexical information at the verbal level can be taken in the application of the  $\text{Max}_E$  operator. The perfective prefix is taken as a derivational affix, changing the lexical meaning of the verb. In particular, the prefix has a measure function, enabling an otherwise non-atomic predicate to denote a maximal event. Therefore, without resorting to the lexical information beyond V, such as the object, already the  $\text{Max}_E$  operator can apply, because a maximal event is denoted by the verbal predicate. Filip & Rothstein (2000) did not make explicit the grammatical nature of this operator, but from what they explicitly proposed, the application of this operator is a pure semantic operation, and therefore there is no syntactic node corresponding to the operator. That's why this account is referred to here as a lexicalist approach, because  $\text{Max}_E$  operator in the account takes the function of changing the denotation of the predicate (V or VP).<sup>1</sup>

Filip & Rothstein (2000) have captured the surface differences of telicity between Germanic and Slavic languages. The major problem is as follows: this approach relies on the different domains of quantification imposed by a null  $\text{Max}_E$  operator. We may further ask what determines this domain (V or VP). Or to put it in another way, why does this operator apply selectively when taking effect in different languages? Also, this assumption is not in line with the recent Minimalist view of linguistic variation, especially the Borer–Chomsky conjecture (cf. Baker 2008; Roberts & Holmberg 2010) which reduces variation to feature related factors in the lexicon.

### 3.2 The syntactic approach

The syntactic approach, taken by researchers like Borer (2005a,b), MacDonald (2008), and Travis (2010), assumes that telicity or inner aspect is encoded in the syntax. Here I will concentrate on Borer's (2005a; 2005b) exo-skeletal (XS) based account of telicity, which will also be taken as the theoretical framework for the issues to be explored in this paper.

Like other research by Bach (1986) and Rothstein (2004), the XS model captures the semantic parallelism between the domain of events and that of objects. The

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<sup>1</sup>An anonymous reviewer suggests that  $\text{Max}_E$  operator might also be a syntactic feature. I agree with this possibility, although this is not really the proposal in the original account, which takes the application of  $\text{Max}_E$  as a pure semantic operation. In addition, if  $\text{Max}_E$  is a syntactic feature, it should be specified on the same functional head, and it will be difficult to explain why this feature applies to V and VP respectively in different languages.

XS model takes a step further by specifying two parallel functional structures encoding events and nominals. The functional structures encoding events and objects, which are EP (event phrase) and DP (determiner phrase) respectively, both involve a quantity head and a deictic head (E in EP and D in DP) that anchors the entity (either an event or an object). In an extended projection, i.e. functional structure, it is assumed that each functional head specifies an open value, which has to be assigned range so that the semantic function can be available for the interpretation of the structure. Range assignment can be either direct or indirect. The direct range assignment involves the merging of a functional item to 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,<sup>2</sup> and specifier–head agreement (Borer 2005b: 18). 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.

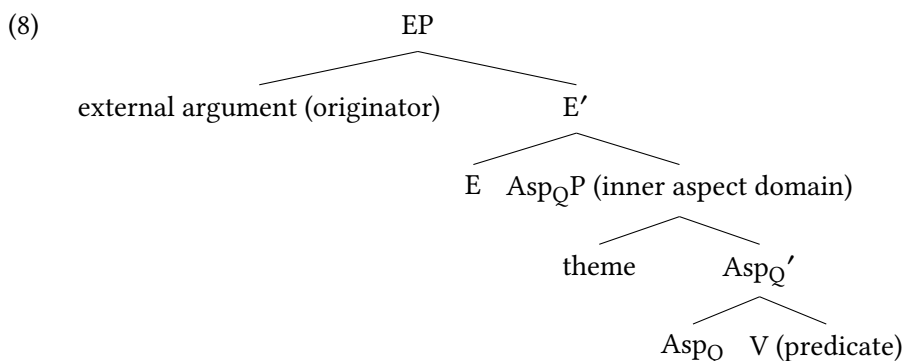
Borer (2005a,b; 2013) postulates that the underlying reason for linguistic variation is tied to how an open value is assigned range. For example, variation might arise from whether the range is assigned in the shape of a bound morpheme or a functional item, or whether the range assignment is achieved directly or indirectly. While there are various definitions of interpretable and uninterpretable features (cf. Pesetsky & Torrego 2004), in general the pair of open value and range is the equivalent to the pair of uninterpretable and interpretable features. Therefore, for the ease of exposition, in the rest of this paper, I will use the terms of uninterpretable and interpretable features.

Following the Davidsonian approach (Davidson 1967; 1980; Parsons 1990), Borer (2005a) argues that the functional structure EP is responsible for the derivation of the interpretation of events, including that of the event participants as well as the temporal situation of the event, i.e. inner aspect. 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:

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<sup>2</sup>The accurate mechanism of the range assignment by an adverb of quantification or a discourse operator is not elaborated on in Borer’s system. This type of range assignment is not directly relevant to our account, and thus I will not explore it further.





While according to the lexicalist approach to argument structure (cf. Chomsky 1970; Reinhart 2003), the roles of event participants are projected by the predicate which is embedded at the bottom of the functional structure, in the XS model, the predicate does not contain any syntactic information such as the thematic grid. The interpretation concerning the theta roles of event participants and telicity is derived from the functional structure EP, and the predicate only provides conceptual meaning that modifies the functional structure. The  $Asp_Q$  head in EP is the counterpart of the quantity head in DP, responsible for the quantification of the event, and the valuation of the feature specified on this head is the source of telic interpretation. 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  $Asp_{QP}$  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:

(9) John ate three apples *in five minutes*.

(10) John ate apples \**in five minutes/for five minutes*.

Following the XS model, in (9) 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 (10), the bare plural *apples* does not bear an interpretable quantity feature, which means in this sentence, if the  $Asp_Q$  head projects, the valuation of the quantity feature, and hence telic interpretation, cannot be achieved.

Just like the DP structure, in EP the functional head specifying the quantity feature is optional, which is exactly the case of atelic events. When  $Asp_Q$  head

does not project, which is the case of atelic events, a layer of F<sup>SP</sup> will appear in the otherwise Asp<sub>QP</sub> position, and the [Spec F<sup>SP</sup>] position will host a DP that is the theme of the event.<sup>3</sup> Since this paper focuses on telicity, F<sup>SP</sup> will not be discussed.

As mentioned above, in English, the quantity feature on the Asp<sub>Q</sub> head is valued with the indirect strategy: copying the quantity feature of a DP in [Spec Asp<sub>QP</sub>] via agreement. In theory, it is possible that in some languages the direct valuation strategy might be available, if there is a functional item in the lexicon that bears an interpretable quantity feature. 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:

- (11) Czech (Filip 1997: 62)
- a. Pil<sup>I</sup>            víno.  
   drank-SG wine-SG-ACC  
   ‘He was drinking (the) wine.’
  - b. Vypil<sup>P</sup>            víno.  
   PFV-drank-SG wine-SG-ACC  
   ‘He drank up (all) the wine.’

In the above example, the prefixed perfective verb gives rise to a telic interpretation. In addition, the prefix also forces a definite and quantity reading on the bare object, as is shown in (11b). Without the perfective prefix, no telic reading is attested, and the bare noun does not need to take a definite reading or quantity reading as shown in (11a).

Borer (2005b) takes such data as evidence of the paradigm of direct range assignment (feature valuation). In particular, a perfective prefix in Slavic languages is a functional item that bears the interpretable quantity feature, which is directly merged in the Asp<sub>Q</sub> 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 to value the uninterpretable D feature ([*u*D]) on the D head of the DP, as is the case in (11b).

<sup>3</sup>In Borer’s (2005b) original model, the nominal in the [Spec Asp<sub>QP</sub>] takes the role of “subject of quantity”, while the nominal in the [Spec F<sup>SP</sup>] position takes the role of “default participant”. Abstracting away technical details that do not concern the discussion in this paper, and for ease of exposition, I will simply use the term “theme” to refer to the DPs in the [Spec AspP] and [Spec F<sup>SP</sup>] positions.

## 4 Telicity in Yixing Chinese

Chinese is not considered in previous studies on the cross-linguistic variation of telicity, mostly because how telicity is derived exactly in Chinese is not well understood.<sup>4</sup> The inner aspect of Chinese is widely mentioned in the vast literature on the famous verb particle *le*, which is often assumed to be related to telicity in one way or another (cf. Smith 1997; Lin 2003; Soh & Gao 2007; Soh 2009; 2014). However, the mechanism of telicity in Chinese is by no means clear, partly because the verbal *le* does not always give rise to telicity:

(12) Mandarin

- a. ta wu fenzhong li chi le san ge pingguo.  
 He five minute in eat LE three CLF apple  
 ‘He ate three apples in five minutes.’
- b. ta (\*wu fenzhong li) he le cha le.  
 He five minute in drink LE tea LE  
 ‘He has already drunk tea \*in five minutes.’

Obviously, without knowing the precise factor determining telicity in Chinese, it is impossible to bring Chinese into the broad picture of telicity parameter. In Hu (2016), I used data from Yixing Chinese<sup>5</sup> to show that the verbal *le* in Mandarin is not a homogeneous category, but is the phonological realisation of two homonymous categories, one being the inner aspectual marker, which is the counterpart of *lə* in Yixing, and the other is an outer aspectual marker, which corresponds to *dza* in Yixing. In this section, I present the major properties of *lə* that are closely related to the central topic of this paper, i.e. the variation of telicity, while leaving other properties aside (but see Hu 2016). To distinguish *lə* from *dza*, the properties of *dza* will also be presented when necessary.

In Yixing, all the achievement and accomplishment predicates with an incremental theme can occur in a *lə*-marked sentence. In addition, when *lə* occurs, a telic interpretation arises invariably, as is evidenced by the compatibility with

<sup>4</sup>In the final stage of proofreading this paper, I was informed that Peng (2017) discovered that in Chinese dialects like Pingxiang, there are also two distinct particles that both correspond to the verbal *le* in Mandarin. Peng also shows that one particle is a telic marker, which further supports the analysis made here. I would like to emphasise that I am by no means the first to correlate telic function with verbal *le* in Mandarin. The crucial point made in this paper is how parameters of telicity could be derived with such linguistic phenomena.

<sup>5</sup>Yixing Chinese is a variety of Wu dialect, spoken in Yixing county with a population of 1,243,700, a subdivision of Wuxi city in China’s Jiangsu province.

the Chinese version of the *in x time* phrase. That is, a *lə*-marked sentence always denotes an atomic event in the sense of Rothstein (2004).

- (13) Achievement predicate  
tə sasə fəŋdʒoŋ lidou mə lə sa bən fy.  
He thirty minute in lose lə three CLF book.  
'He lost three books in thirty minutes.'
- (14) Accomplishment predicate  
tə sasə fəŋdʒoŋ lidou tʃɛ lə sa dʒə bŋŋgo.  
He thirty minute in eat lə three CLF apple.  
'He ate three apples in thirty minutes.'

There is evidence that telicity is not the information taken by the predicate in Yixing. Instead, telicity is directly related to *lə*, as when *lə* is not available, even with a quantised incremental theme and a homomorphic predicate, still a telic interpretation cannot be attested. For example, the examples in (15) will be unacceptable if *lə* is replaced by another verbal particle or if there is no particle at all:

- (15) Yixing Chinese
- a. \* tə sasə fəŋdʒoŋ lidou mə Ø / dʒə / go sa bən fy.  
he thirty minute in lose Ø / dʒə / go three CLF book.  
intended: 'He lost three books in thirty minutes.'<sup>6,7</sup>
- b. \* tə sasə fəŋdʒoŋ lidou tʃɛ Ø / dʒə / go sa dʒə bŋŋ go.  
he thirty minute in eat Ø / dʒə / go three CLF apple.  
intended: 'He ate three apples in thirty minutes.'

The examples in (13) and (14) on the one hand, and (15) on the other form a minimal pair, clearly indicating that what plays a crucial role in yielding telic interpretation is the particle *lə*.

What further augments the above descriptive conclusion is that *lə* may also force the event with an activity or state predicate to yield a telic interpretation, although such predicates usually appear in atelic events in Vendler's classification.

<sup>6</sup>Ø stands for zero-particle, i.e., the situation when no particle occurs.

<sup>7</sup>The verbal particle *go*, which is the counterpart of *guo* in Mandarin, often indicates that an event happened before a certain time but does not have an effect on the topic time (cf. Smith 1997; Soh 2014).

(16) Yixing Chinese

- a. Context: Zhangsan's work is to push the cart with goods from the market to the shop, and the following sentence is uttered to express the working load Zhangsan has achieved in 30 minutes:  
 dzaŋsa sasə fəŋdzoŋ lidou tae lə sa tso ho.  
 Zhangsan thirty minutes in push lə three cart good.  
 'Zhangsan pushed three carts of goods in 30 minutes.'
- b. dzaŋsa dʒiŋdzo jɿ te lidou kaefiŋ lə sa tsi.  
 Zhangsan today one day in happy lə three time.  
 'Today, Zhangsan became happy three times in one day.'

The events denoted by the above two sentences are telic, evidenced by the adverbial *in x time*. Although these two sentences involve an activity predicate and a stative predicate respectively which in most cases appear in atelic sentences, the telic interpretation is obligatory because of the presence of *lə*. What is especially noteworthy is that although *kaefiŋ* 'happy' is often used as an adjective, it takes a dynamic reading here denoting a change of state, roughly equivalent to *to become happy* in English. As illustrated below: without *lə*, the above sentences will be unacceptable:

(17) Yixing Chinese

- a. \* dzaŋsa sasə fəŋdzoŋ lidou tae Ø / dza / go sa tso ho.  
 Zhangsan thirty minutes in push Ø / dza / go three cart good.  
 intended: 'Zhangsan pushed three carts of goods in 30 minutes.'<sup>8</sup>
- b. \* dzaŋsa dʒiŋdzo jɿ te lidou kaefiŋ Ø / dza / go sa tsi.  
 Zhangsan today one day in happy Ø / dza / go three time.  
 'Today, Zhangsan became happy three times in one day.'

The previous studies on the verbal *le* in Mandarin mainly focus on the semantic effects relevant to the event, such as whether it denotes a completion or termination of an event and whether it signals the realisation of a state that holds at the topic time. The possible relationship between verbal *le* and the nominal theme is never considered. With Yixing data, the quantificational effect of *lə* over the nominal theme of the event is brought to our attention. In Yixing, *lə* occurs in a sentence where the nominal theme has a quantity reading. Whenever a non-quantity reading is imposed on the nominal theme, the sentence will be

<sup>8</sup>The context of this sentence is exactly that of (16a).

unacceptable. As I will show shortly, bare nouns can be the theme of the verbs marked with *lə*; when this occurs, the bare noun will not have the mass reading or bare plural reading,<sup>9</sup> but will be forced to take a specific and quantity reading. Therefore, the requirement of the quantity theme can be met in two situations. Firstly, *lə* can co-occur with a nominal that involves an overt numeral, clearly indicating quantity:

- (18) Yixing Chinese  
 tɔ̃ ʃɛ̃ lə sa dzə bɪŋgo.  
 He eat lə three CLF apple.  
 ‘He ate three apples.’

If a bare nominal occurs as the theme with a mass or bare plural interpretation, the sentence will be ungrammatical:

- (19) Yixing Chinese  
 a. \* tɔ̃ ʃɛ̃ lə dʒu li.  
 He eat lə alcohol li.  
 intended: ‘He has had alcohol.’  
 b. \* tɔ̃ ʃɛ̃ lə bɪŋgo li.  
 He eat lə apple li.  
 intended: ‘He has had apples.’

A bare nominal theme, if it is to be compatible with *lə*, must have a quantity and definite specific reading. This quantity/definite reading is possible when the bare nominal is fronted to a topic construction. Three positions are possible if the object is taken as the topic in Yixing (and in Mandarin): clause initial position, the position in between the subject and the verb (SOV), and the complement position of *ba*,<sup>10</sup> which is *nɔ̃* in Yixing. These three positions all can hold the bare nominal object when it co-occurs with *lə*.<sup>11</sup> In the following examples, the bare noun *dʒu* ‘alcohol’ has a quantity and specific interpretation: for such examples to be grammatical, it has to mean a certain quantity of alcohol, as well as the

<sup>9</sup>Like Mandarin, Yixing does not have a plural marker in general, so nominals with mass and bare plural readings both have the form of bare nominals.

<sup>10</sup>In Mandarin, *ba* occurs after the subject and takes the object in its complement position, where the object is often interpreted as the topic. Its counterpart in Yixing is *nɔ̃*, which works exactly like *ba*. For a comprehensive description and analysis of the *ba*-construction, see Huang et al. (2009: 153–196).

<sup>11</sup>This description ignores possible underlying structural differences, which aren’t crucial here.

presupposition that this quantity of alcohol is known to both the hearer and the speaker.<sup>12</sup>

(20) Yixing Chinese

ɕu ɲo jidʒiŋ tʃɛ lə li.  
alcohol I already eat lə li.

‘I have drunk the alcohol (i.e. the certain amount of alcohol has been drunk up by me).’

(21) Yixing Chinese

ɲo ɕu jidʒiŋ tʃɛ lə li.  
I alcohol already eat lə li.

‘I have drunk the alcohol (i.e. the certain amount of alcohol has been drunk up by me).’

(22) Yixing Chinese

ɲo jidʒiŋ nɔ ɕu tʃɛ lə li.  
I already nɔ alcohol eat lə li.

‘I have drunk the alcohol (i.e. the certain amount of alcohol has been drunk up by me).’

We can thus draw a descriptive conclusion: a quantity theme is an obligatory requirement of *lə*. This requirement is met when a nominal phrase already takes a quantity feature provided by the numeral; if a numeral is not available as is in the case of bare nominals, *lə* seems to “offer” a quantity interpretation. In Hu (2016), following Borer (2005b), it is argued that this is made possible because the quantity feature of the telic item *lə* is copied onto the nominal in the [Spec Asp<sub>Q</sub>] position, thus presenting a symmetry with the situation in English: In English, without a functional telic item, the quantity feature of a DP in [Spec Asp<sub>Q</sub>] has to be copied on the Asp<sub>Q</sub> head, while in Chinese, with the feature provided by the telic item, the quantity feature on Asp<sub>Q</sub> head is copied onto the nominal phrase in [Spec Asp<sub>Q</sub>].

## 5 Exploring the telicity parameter

### 5.1 An initial account

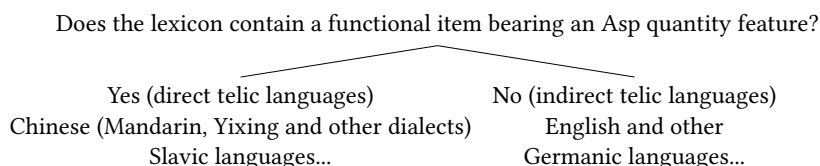
So far, with both Chinese, English and Slavic data, it seems that telic variation can be neatly accounted for with Borer’s XS model. All the cross-linguistic issues

<sup>12</sup>For an account of fronting the object in these examples, see Hu (2016).

can be reduced to a single factor: whether there is a functional item specifying quantity feature in the lexicon<sup>13</sup>, which can be directly merged in the Asp<sub>Q</sub> head to value the uninterpretable quantity feature on this functional head ('Asp quantity feature', to be distinguished from the quantity feature of DP).

The parameter of telicity can therefore be summarised below:

(23) Telicity parameter (first version)



In the above division, I use the term direct telicity language (DT language for short) to refer to languages that contain a functional item to directly value the feature on the inner aspectual head, while indirect telicity language (IT language for short) refers to those that have to adopt an indirect mechanism such as spec-head agreement to value this feature. The above single parametric factor results in the cluster of differences in Table 16.1.

Table 16.1: Properties of DT and IT languages (first version)

	Does telicity rely on quantity objects?	Does telicity provide quantity reading to bare nominals?	Does quantity object impose telicity?
DT languages <sup>a</sup>	no	yes	no
IT languages <sup>b</sup>	yes	no	yes

<sup>a</sup>(Chinese, Slavic Languages)

<sup>b</sup>(English and other Germanic languages)

Table 16.1 shows that a single telicity parameter based on the existence of a functional item bearing the quantity feature is the underlying reason for a range of cross-linguistic variations. I have already shown at different points in this

<sup>13</sup>I am assuming the proposal initiated in Distributed Morphology (cf. Halle & Marantz 1993; Marantz 2007) that a lexicon of a language has both functional items and lexical items, with the former specifying features to be engaged in syntactic computation, and the latter mainly takes conceptual meaning.



paper that for Chinese and Slavic languages, telic reading does not rely on the quantity object. What is crucial is the presence of the inner aspectual functional item. On the other hand, for languages like English which lacks such a functional item, the indirect feature valuation of the quantity feature on the inner aspectual head is taken, which relies on the copying of the quantity feature of the DP in the [Spec Asp<sub>QP</sub>] position. This explains why languages like English have to rely on the quantity nominal object to derive telic reading. The same parametric difference also directly explains why quantification over bare nominals only occur in DT languages: the functional item bearing a quantity feature can scope over the bare nominal in the [Spec Asp<sub>QP</sub>] position, while in IT languages like English, without such a functional item, naturally this type of quantification is impossible.

So far, the parametric account of telicity is completely based on Borer's (2005b) XS model, and this paper provides data from Yixing to further support this account: Borer's account predicts that it is possible that a quantity functional item might exist in other languages other than Slavic languages, and Yixing data confirm this prediction.

## 5.2 Telicity parameter: A further specification

Huang (2015) points out that Chinese verbs seem to be inherently atelic, which can be illustrated by the following examples,<sup>14</sup> an observation also noticed in Tai (1984) and Smith (1997).

- (24) Yixing Chinese  
 ɖʒaŋsa sasə fəŋdʒoŋ lidou ʃɛ lə sa foŋ ʃiŋ, dazi ji foŋ a  
 Zhangsan thirty minute in write lə three CLF letter, but one CLF even  
 mə wəɖzəŋ.  
 not complete.  
 'Zhangsan wrote three letters in thirty minutes, but none of the letters  
 was completed.'

Even with the marker *lə* in Yixing, still the action does not seem to have an endpoint because the three letters are not finished. In order to guarantee the information of completeness, a "completeness particle" has to be attached to the verb. Note that there are different completeness particles in Chinese, which match different verbs. This fact carries over to Yixing. Below I use a Yixing example for the sake of consistency, wherein *wə* (counterpart of *wan* in Mandarin) is a completeness particle.

<sup>14</sup>Since the verbal *le* in Mandarin can be either an outer or inner (telic) marker, to avoid confusion, we use Yixing in this paper to illustrate relevant points in Chinese.

(25) Yixing Chinese

dzaŋsa sasə fəŋdzoŋ lidou ʃɛ-wə lə sa foŋ ʃiŋ, \*dazi ji  
 Zhangsan thirty minute in write-finish lə three CLF letter, but one  
 foŋ a mə wədzəŋ.  
 CLF even not complete.

‘Zhangsan finished writing three letters in thirty minutes, but none of the letters was completed.’<sup>15</sup>

This appears to contradict the assumption that *lə* is a telic marker that imposes telic interpretation. Huang’s (2015) explanation is that Chinese verbs are inherently atelic and thus a completeness particle is required to denote telic events. However, this account is problematic considering the fact that the completeness particle on the one hand cannot guarantee the derivation of telicity, and on the other hand telicity can arise even without such particles. As I have already shown in this paper, without *lə*, a telic sentence will not be acceptable, and the data also show that many *lə*-marked telic sentences do not need completeness particles. So here is a puzzling issue: on the one hand, *lə* does seem to take the responsibility of marking telicity, but on the other hand, without a completeness particle, the event, at least in the traditional assumption, does not always express an endpoint.

To address the above puzzle, the clarification of “endpoint” is crucial. Concerning the data in (25), “endpoint” is often understood as the point when the whole event is measured out by the theme argument: if the matrix verb is a consumption verb, the endpoint is understood as the point when the final bit of the food is consumed. If we think further, we will realise that this type of endpoint does not equate to the endpoint in defining telicity. The interpretation of a telic event comes from the linguistic expression of an endpoint of an event. Here, what is at stake is that the linguistic derivation explicitly provides the information that the event ends at a point, regardless of whether this is the point when the event is measured up by the object. With this in mind, I posit the following hypothesis:

- (26) *lə* in Yixing (and the inner aspectual *le* in Mandarin), as a pure telic functional item, provides the abstract meaning (semantic feature) that the event ended at a certain point.

Note that the above hypothesis about the semantic contribution of *lə* is a natural consequence of the assumption that *lə* is a pure telic marker. Since, as I

<sup>15</sup>Note that the symbol “\*” in (25) does not mean the clause itself is ungrammatical, but only shows that the information expressed by the clause contradicts that of the preceding clause. This also applies in the following examples of this section.

have pointed above, telicity is characterised with the endpoint of an event, a telic marker should be responsible for introducing this semantic characteristic. This means that as long as *l*<sub>∂</sub> is involved in the sentence, an endpoint is expressed linguistically, and this endpoint does not have to be the point when the event is measured up by the object. For the convenience of exposition, I term the latter type of point as measuring up point, to be distinguished from endpoint.

For *l*<sub>∂</sub>-marked sentences with canonical accomplishment verbs, the default interpretation is that the event reaches an endpoint when the event is measured up by the object. This is so because to the language user, the measuring up point is the most accessible endpoint of such events. However, as long as there is supporting contextual information, such a default interpretation can be cancelled. This is exactly the situation of the example in (24). The second clause indicates that the event was not measured up by “the three letters”. Since the telic marker *l*<sub>∂</sub> provides the explicit information that the event of writing three letters ended at a certain point, and since the second clause cancelled the identification of the endpoint with the measuring up point, we are forced to take another interpretation that in this event, the agent had the plan to write three letters, but he ended this writing event without completing any of the three letters. This event is still telic, because it is explicitly expressed that the event arrived at an endpoint, while how much the agent had written for each letter was not specified. The *in x time* diagnostic in (24) also shows that this sentence, although lacking a measuring up point, is telic.

Now we have to address this question: why is it so that for the telic accomplishment events in English, the endpoint is always identified with the measuring up point?

(27) John ate three apples in 5 minutes, \*but he did not eat up any of the apples.

(28) John wrote three letters in 3 hours, \*but none of the letters was completed.

This question can be addressed by the mechanism of feature valuation for the derivation of telicity. Note that in English, no functional telic item is available in the lexicon, and telicity arises when the quantity feature of the object DP is copied onto the *Asp<sub>Q</sub>* head. A semantic consequence of this syntactic operation is that the endpoint expressed by the sentence must be identified with the measuring up point: after all, the interpretable quantity feature assigned to the inner *Asp<sub>Q</sub>* head is exactly the quantity feature of the object DP, and the identification of the endpoint and the measuring up point is the reflection of this syntactic operation. This identification is imposed by syntactic operation, and therefore is

not cancellable, but part of the semantic meaning that contributes to the truth value of the proposition.

Following the analysis developed so far, it can be predicted that if a language has a functional item that can directly value the feature on the inner  $Asp_Q$  head, the situation of the Chinese example in (25) should also occur in this language. But the Slavic data seem to invalidate this prediction: I have argued, following Borer (2005b), that the perfective prefixes in Slavic languages are functional items that provide the interpretable quantity feature to the inner  $Asp_Q$  head. This implies that such prefixes are in nature equivalent to *la* in Yixing. Considering the hypothesis in (26), the identification of the event endpoint with the measuring up point in Slavic languages should also be a piece of cancellable default information. This prediction does not hold, though, as shown by the following Czech examples:<sup>16</sup>

(29) Czech

- a. Dneska jsem *napsal* pět dopisů, \*ale ani jeden z nich jsem ne-*dopsal*.  
 Today I wrote-PFV-SG five-ACC letter-PL-POSS but even one of them I not-finished writing-PFV-SG  
 ‘Today I wrote five letters, but I finished none of them.’
- b. Během pět měsíců jsem *přečetl* dvě knihy, \*ani jednu z nich jsem ne-*dočetl*.  
 Within five-POSS month-PL-POSS I read-PFV-SG two-ACC book-PL-ACC even one of them I not-finished reading-PFV-SG  
 ‘In five months I have read two books, but I did not finish reading either of them.’

I postulate the following hypothesis on the nature of perfective prefixes in Slavic languages:

(30) The perfective prefixes in Slavic languages like Russian and Czech have double functions:

*Function A (Semantic function):* A Slavic perfective prefix functions as a lexical particle that enriches the lexical information, i.e. conceptual meaning, of the verb; more specifically, it provides the information entailing the identification of the endpoint of an event with the measuring up point.

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<sup>16</sup>I thank Eva Roubalová for providing these two examples and Nong Xi for providing further clarification with the data.

*Function B (Syntactic function):* A Slavic perfective prefix can work as a functional item that values the quantity feature on the inner Asp<sub>Q</sub> head.

Function A is invariable, while function B is optional.

Explanation of the above hypothesis is in order. Function A is largely in line with the proposal made in Filip (2005) and Filip & Rothstein (2000) that Slavic perfective prefixes are lexical operators applied to verbal predicates, an assumption also in line with Partee (1995). This assumption equates prefixes in Slavic with Chinese completeness particles, both contributing concrete lexical information to the predicate. In fact, when Slavic prefixes and Chinese completeness particles are viewed together, we can see their surface similarities: both Slavic prefixes and Chinese completeness particles have different forms corresponding to different predicates; both contribute the lexical information of the entailment that the endpoint of the event is the measuring event. Note that if we take the assumption that telicity is the result of feature valuation, then such lexical items, either the Slavic prefixes or Chinese completeness particles, cannot give rise to telicity because they are not functional (inflectional) items. This is the case in Chinese: I have shown that Chinese completeness particles alone cannot yield telicity. But Slavic prefixes do have the function of yielding telicity. This is due to function B: in addition to the lexical information, Slavic prefixes also take an interpretable feature, i.e. the quantity feature. This explains why on the one hand telicity is yielded by the perfective prefix in Slavic, and on the other hand, the entailment of the identification of the endpoint with the measuring point is also attested.

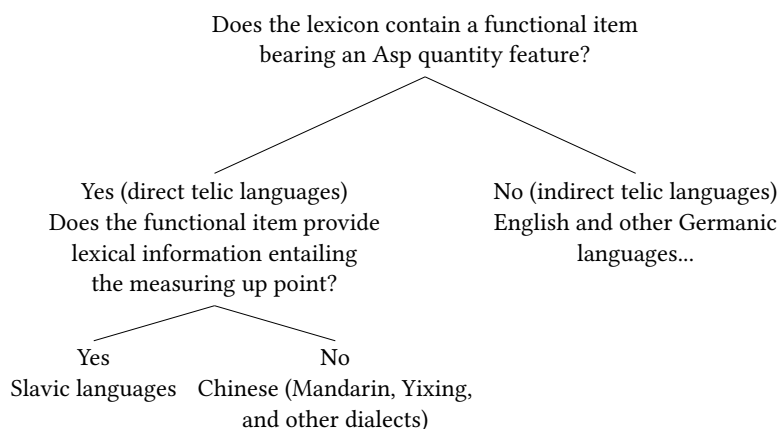
It then follows that a Slavic perfective prefix takes the functions undertaken by completeness particles and *lǎ* respectively in Chinese. Therefore, a prediction we can make is that to denote the semantic information yielded by the Slavic perfective prefix, i.e. both telicity and the endpoint identification with measuring up point, in Yixing both a completeness particle and *lǎ* are required. This is exactly the case of the example in (25).

The hypothesis in (30) also claims that function B, i.e. the function of serving as a functional item, is optional. The consequence is that we can expect that more than one prefix can be stacked on a single verb in Slavic, with only one prefix undertaking function A. This is a fact pointed out by Filip & Rothstein (2000), who take this fact to argue against Borer's (2005b) hypothesis of taking perfective prefixes as telic functional items: if a perfective prefix is a functional item, it should not be expected to co-occur with another perfective prefix attached to the same verb. Now with the hypothesis in (30), it is clear that when the stack of

two perfective prefixes occurs, one of them is only a lexical particle,<sup>17</sup> while the other serves as a telic functional item.

The above analysis shows that the DT languages in Table 16.1 do not constitute a homogeneous type, but can be further divided depending on the properties of the telic functional item. The parameter hierarchy of telicity can thus be enriched, presenting a more fine-grained picture below:

(31) Telicity parameter (revised version)



It should be noted that only a small number of languages are mentioned in the above hierarchy. I assume that most, if not all, languages can fit into this hierarchy depending upon the properties of their lexicons regarding telic functional items. The above hierarchy of parameters follows the spirit of parametric variation articulated in Roberts & Holmberg (2010) as well as the ReCoS project (Roberts 2010), which resolves the tension between micro and macro parameters. In this sense, this research contributes to the research of ReCoS by adding a new hierarchy of parameters to the broad picture of comparative syntax detailed by the various studies conducted in this project. Another potential contribution of this analysis is that the BCC style parametric variation can be reduced not only to the formal features in the lexicon, but also to whether a functional item also bears some lexical information. This assumption is not confined to the analysis of telic parameters, but also carries over to a wide range of syntactic issues in Chinese (cf. Huang 2015; Hu 2018: Ch. 4).

<sup>17</sup>This assumption implies that if a perfective prefix only takes function A, it is not a functional item but a lexical one, and hence should be merged in a position different from that of both function A and B. In this paper, we do not go further to explain the syntactic position of the lexical item. We concur with Basilico (2008) that it is a Root merged to the Root of the verb.

The classification of the linguistic properties listed in Table 16.1, accordingly, needs to be expanded by adding the further classification in Table 16.2.

Table 16.2: Further classification of DT languages

	Telic functional item(s) available in the lexicon?	Telic functional item contributing lexical information?	Telic sentence entailing the identification of endpoint with measuring up point?
Chinese	yes	no	no
Slavic lgs.	yes	yes	yes

## 6 Conclusion

This paper takes a basic theme of Borer (2005b) that telicity is not part of lexical information, but the result of syntactic derivation via the standard feature valuation mechanism in Minimalism (Chomsky 2000; 2001). I argue, relying on the description and analysis of Yixing Chinese in Hu (2016), that like Slavic languages, Chinese also has a functional telic item that values the quantity feature on the inner aspectual head. Further, it is proposed that Chinese differs from Slavic languages in that the telic functional item in the latter also contributes lexical information that entails the identification of event endpoint with the measuring up point. A tiny difference in these properties will lead to a cluster of variation among languages, which is in line with the broad implication of the hierarchy of parameters articulated in Roberts & Holmberg (2010) as well as the ReCoS project summarised in Roberts (2010). With a close scrutiny of the completeness particles and verbal *le* in Yixing Chinese and the perfective prefix in Slavic languages, this paper also explicates how the lexical information and syntactic features specified on these items (particles or prefixes) interact in deriving the surface semantic interpretation. This line of explanation thus provides further issues and perhaps new perspectives on the recent assumptions about semi-functional items in Huang (2015) and the multi-functionality hypothesis of particles in Biberauer (2017a,b).

## Abbreviations

ACC	accusative	IT	indirect telicity
BCC	Borer–Chomsky conjecture	PFV	perfective
CLF	classifier	PL	plural
DT	direct telicity	POSS	possessive
IPFV	imperfective	SG	singular

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