Typology of Quantifiers and the Mass/Count Distinction: A Case Study of Chinese *xie*

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In a recent approach to the internal structure of nominals, all nouns across languages are proposed to be mass, and thus need to be portioned out (i.e., divided) in order to interact with the count system (Borer 2005): in syntax, division is performed via a Div(ided) head that takes mass noun as a complement, and Div is proposed to be instantiated by an English-type plural -*s* or a Chinese-type classifier. Once division is performed on a mass, the divided noun can be counted via a numeral that appears in a quantifying phrase (#P) projected above DivP. Assuming Borer (2005), this paper examines the morpheme *xie* 'some' in Chinese, and proposes that it is a non-counting quantifier instantiating a # head that takes DivP as its complement. The proposed account has consequences for the typology of quantifiers and the on-going debate on the mass/count distinction: division does not necessarily force a counting function, and the mass/count distinction, if it exists at all, is a structural one, not a lexical one.

Keywords: Division, classifier, plural, quantifier, counting

1. Introduction

The internal structure of nominals is an intricate product, being the central locus of elements such as definiteness, quantification, plurals, classifiers, gender, and so on. As such, the internal structure of nominal phrases has been under much debate in the literature (e.g, Abney 1987; Ritter 1991; Lyons 1999; Ghomeshi 2000; Borer 2005; Wiltschko 2008; Kramer 2009; among many others). The goal of this paper is to contribute to

this debate by examining the quantifier *xie* in Chinese with respect to the syntax of plurals and classifiers, in the framework of the recent proposal on nominal structure in Borer (2005), which has been discussed in recent studies of nominal structure for other languages (e.g., Wiltschko 2008 for Halkomelem (Salish), Mathieu 2012, 2014 for Ojibwe (Algonquian) and Arabic, KM, Kim and Melchin to appear for Korean).

Chinese is a well-known classifier language, and the properties and structure of its classifier phrases have been much discussed in the literature (e.g, Chao 1986; Tang 1990; Chierchia 1995; Cheng and Sybesma 1998; Borer 2005; Cowper and Hall 2012). Although the details differ, recent studies suggest that a Chinese type of classifier is functionally equivalent to an English-type plural *-s* (e.g., Borer 2005; Cowper and Hall 2012). For instance, in Borer (2005), assuming all nouns across languages are mass, the plural marker *-s* in English (1a) and a classifier such as *ben* in Chinese (1b) are proposed to play similar roles, namely portioning out mass, i.e., dividing mass. As such, they are both represented by the same syntactic head Div(ided) as in (2) (to be detailed in section 2).

(1) a. three books
    b. san   ben   shu
       three CL   book
       'Three books'   (Cheng and Sybesma 1998)

(2) [#P   #   [DivP Div   [NP N]]

In (2), above DivP is the projection #P, which is the locus of quantity. For example, the numeral *san* 'three' appears in this domain. As #P is a quantity phrase, it can also host quantifiers other than numerals, such as 'a few' or 'much', with different restrictions on the types of complements that it can take, as will be detailed in section 2.

In this type of nominal structure (2), however, it is not clear how to account for the presence of a plural-like morpheme in a classifier language such as Chinese.[1] Chinese has a plural-like morpheme *xie*, similar to

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1) In Chinese, *-men* is proposed to be a plural morpheme that is suffixed to a noun (e.g.,

English plural *-s*. Following the tradition in the Chinese literature (Iljic 1994; Cheng and Sybesma 2000; Li 1999), I gloss *xie* as 'some'.[2] When this morpheme appears with a noun, the noun is pluralized, as illustrated in (3): *xie* precedes the noun *shu* 'book', and the interpretation of the noun is plural 'books'.[3] A bare noun in Chinese is well known to be number neutral, allowing either a singular or a plural reading (e.g., Cheng and Sybesma 2000; Rullmann and You 2006). Once *xie* appears with a bare noun, as in (3), only the plural reading is available. This type of data suggests that *xie* may be a plural marker, as proposed in Yang (2005) (discussed in section 3.3).

(3) wo lai   na   xie   shu
    I   come   take   some   book
    'I come to take some books (/*a book).'

Adopting Borer's structure (2005), then *xie* as a plural marker would instantiate Div in (2). However, *xie* does not allow a numeral larger than one, as shown in (4), which seems to be in contradiction to the proposal of *xie* as a plural marker that realizes Div.

(4) *zhe   xie   san   ben   shu
    This   some   three CL   book
    'These three books'

Other studies have proposed that *xie* is a classifier (e.g., Cheng and

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Chao 1968; Norman 1988; Li 1999; KM, Kim and Meng 2017). Thus, the presence of plural *-men* would not interfere with *xie* that has to precede the noun. This prediction is correct, as illustrated in (i). This instance is sufficient to show that *xie* would not compete for the same position as *-men*, and this paper does not further question the interaction between *xie* and *-men*. Note that *-men* is optional on a noun, and in the data presented in this paper it does not appear.
(i) zhe xie   ren-men
   This some person-PL
   'These people'

2) Chinese has a similar meaning of word to *xie*, namely *dian* 'some/little'. However, the distribution of *dian* is not the same as *xie* (Iljic 1994). Although interesting, I will leave the investigation of *dian* as a future research.

3) Chinese data without citation is from consultation with 6 native speakers.

Sybesma 2000) and at the same time a numeral (Borer 2005). These proposals can be translated into Borer's structure in (2) such that *xie* realizes Div like a classifier, and moves to #P; and as such, *xie* is proposed to be a numeral divider in Borer (2005) (to be detailed in section 3.2). However, this type of analysis suffers from the fact that *xie* can appear with a classifier such as *ge* (Iljic 1994; Li 2003a, b), as shown in (5). Given the fact that Chinese disallows the co-occurrence of two different classifiers,[4] *xie* as a classifier, as proposed in Borer (2005), predicts that an example like (5) would be ungrammatical, contrary to the facts. It is also not clear why *xie* is proposed to be numeral in Borer (2005), as it does not count at all, unlike a standard numeral, such as 'three' for instance.

(5) zhe   xie   ge   shu
    that   some   CL   book
    'some books'

This paper argues that *xie* is neither a plural marker like in Yang (2005) nor a classifier/numeral like in Borer (2005). In section 4, it is proposed that *xie* is a quantifier that originates in # and it takes DivP as a complement either with a null Div or with an overt Div (instantiated by a classifier *ge*). Note that in the proposed account *xie* does not move from Div, unlike Borer (2005). That is, *xie* is not a divider. This paper proposes that *xie* is a quantifier, but it does not have counting function, unlike a numeral that also appears in #P domain. The proposed analysis of *xie* has consequences for the typology of quantifiers suggested in Borer (2005), and mass/count distinction much debated in the literature, which will be discussion in section 5.

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4) In Chinese, one of the ways to indicate plurality is reduplication of classifier. See (30) in section 4.

2. Nominal Structure: Div(ided) and #P

In this section, I discuss the nominal structure proposed in Borer (2005) which is taken as the basic structure to work with in discussing Chinese nominal structure regarding *xie*. The relevant parts of the nominal structure are illustrated in (6a). In Borer (2005), all nouns across languages are assumed to denote a mass, which needs to be portioned out (i.e., divided) in order for them to interact with the count system. The dividing function is performed by a Div(ided) head (6a). In English, Div is instantiated by the plural marker *-s*, and the noun moves to Div subsequently after the division resulting in plural form *cat-s*. A noun such as *cat* in English is assumed to be mass before division, but once it is divided by Div it can be counted, as indicated by a numeral *three* (6b). In English, a numeral appears in # (6a), head of the Quantity Phrase, #P, which plays the role of assigning quantity to a mass or a division of mass. For example, in (6a), a numeral *three* in # functions as a counter of the division of mass denoted by *cats*.

(6) a. [#P # *three* [DivP Div *-s* [NP *cat*]]]
  b. three cats
  c. *three cat

When plural *-s* does not appear, that is, no division of mass is performed, the noun cannot be counted, as the ungrammaticality of (6c) shows. In (6c), the noun is not marked by plural *-s* which indicates that it is not divided. However, it is counted by the numeral 'three' which results in the ungrammaticality. In the absence of DivP, a mass nominal expression emerges, as illustrated in (7a) with *much salt* (7b). As the mass is not divided, it cannot be counted by a numeral. However, it can be quantified, as is done by the quantifier *much* (7b). An ontologically count noun such as *cat* is also mass when it appears as a bare noun (7c), as assumed, being able to be quantified by the same quantifier as for *salt*.

(7) a. [#P # *much* [NP *salt*]]]
    b. much salt
    c. (too) much cat

A noun divided by plural *-s* can also be quantified by quantifiers (e.g., *several* or *a few*) other than numerals, as shown in (8).

(8) a. several boys
    b. a few boys

As for these quantifiers in (8), they appear in the same position as a numeral, realizing #. In Borer (2005), the plural marker *-s* instantiates the dividing function only, and numerals (e.g., *three*) and quantifiers of the division of mass (e.g., *several / a few*) have the counting function. Although a quantifier such as *much* in (7) also realizes #, it quantifies a mass that is not divided; thus, no counting function is specified for this type of quantifier.

   Turning to the issue of how a singular noun is accounted for under Borer's framework, a singular noun in English is realized with an indefinite article as shown in (9). A singular expression as in (9a) is concluded to be divided since it is counted, i.e., one entity. In Borer (2005), as a bare noun in English is not singular but a mass, Div is absent (see (7a)). However, once a bare noun appears with the indefinite article, it is divided and subsequently counted: the article originates as Div, and moves to # as in (9b). As such, an indefinite article plays both the dividing and counting functions.

(9) a. a cat
    b. [#P # *a* [DivP Div *<a>*   [NP *cat*]]]

In a classifier language such as Chinese, Borer (2005) proposes that Div is instantiated by a classifier. As shown in many studies (e.g., Tang 1990, and Sybesma 1998, 1999), a classifier in Chinese is needed in order for a noun to be counted.[5] Consider the data in (10a-b). The data in (10a)

indicates that the quantity of *shu* 'book' is three, as indicated by the numeral *san*. In this example, the classifier *ben* for books is present. If the classifier is absent, as shown in (10b), the data becomes ungrammatical. The contrast in the data in (10a) and (10b) indicates that the classifier in Chinese is performing a similar function to the plural marker *-s* in English, namely the division function. As such, it instantiates a Div head as illustrated in (10c), and a numeral appears in the specifier of #P.[6]

> (10) a. san   ben   shu
>   three   CL   book
>   'Three books'
>   b. *san   shu
>   three   book
>   Intended meaning:*three books
>   c. [$_{\#P}$ *san#*   [$_{DivP}$ Div *ben*   [$_{NP}$ *shu*]]]

In sum, in both English and Chinese, a nominal is assumed to be mass, and it needs to be divided in order to interact with the quantifying domain (#P). In syntax, a Div head projects performing the division function, which is represented by plural *-s* or a Chinese type classifier. A quantifying phrase, #P, projected above DivP, can perform counting function. A counter, a numeral, merges in #P, but other mass quantifiers, without the counting function, can also appear in #P.

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5) Cheng and Sybesma (1998) propose that classifiers in the language can be divided into two different types. However, as with Borer (2005), I assume that this difference does not interfere with the division function of classifiers. See Borer (2005) for detail.

6) Chinese allows a bare classifier without a numeral to occur with a noun. A bare classifier-noun sequence has a singular reading only (Cheng and Sybesma 2000), e.g., *ben shu* 'a book'/*'books' (see (16a) in section 3.2). Building on this fact, similar to the English definite article *a* (see (9)), Borer (2005) proposes that a bare classifier in Chinese also realizes a # head in addition to a Div head. This proposal is extended to classifiers that appear with a numeral; for example, *ben* in (10c) moves to # head. Thus, in Borer's structure, (10c) proposed for Chinese, a numeral appears in the specifier of #P, unlike an English one that appears as the head # (see (6a)).

3. Basic Data on *xie* and Previous Approaches to *xie*

In this section, I first provide the basic distribution of *xie*, which will be helpful for the rest of the discussion, and then discuss two recent approaches to *xie*. One is from Borer (2005), who proposes that *xie* is a dividing cardinal (henceforth, numeral), building on Cheng and Sybesma (1998). The other is Yang (2005), who argues that *xie* is a plural marker.

3.1. Basic data on *xie*

As mentioned earlier, *xie* behaves like a plural marker in that it pluralizes the noun that it appears with (e.g., Iljic 1994, Yang 2005), as illustrated in (11). As shown in the data in (11), *xie* precedes the noun that it pluralizes.

(11) a. wo   xian   mai   xie   zhi
        I   first   buy   some   paper
        'I will buy some papers first.'
    b. wo   lai   na   xie   shu.
        I   come   take   some   book
        'I come to take some books.'

Xie can be preceded by the numeral *yi* 'one', as shown in (12), but often the numeral is optional as in (11) above. Note that the *xie* phrase is interpreted as plural even though the numeral means 'one'. *Xie* phrases can also be preceded by a demonstrative, as shown in (13).[7]

(12) a. yi   xie   zhi
        one   some   paper
        'Some papers'

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7) In Chinese, a demonstrative is viewed as not specified for number (e.g., Iljic 1994, Yang 2005). Thus, in a plural context as in (13), it is interpreted as plural. By contrast, in a singular context as in (i) where *xie* is absent, it is interpreted as singular. I do not question the syntax of demonstratives in Chinese, and assume that they appear in D (Li 1999, Yang 2005).
(i) zhe   (ge)   zhi
   This   (CL)   paper
   'this paper'

    b. yi   xie   xuesheng
        one   some   student
        'Some students'

(13) a. zhe   yi   xie   zhi
        this   one   some   paper
        'these papers'
    b. zhe   yi   xie   xuesheng
        this   one   some   student
        'these students'

Moreover, *xie* can be followed by a classifier such as *ge*, as illustrated in (14). As indicated in (14), *ge* is optional.

(14) a. yi   xie   (ge)   zhi
        one   some   (CL)   paper
        'Some papers'
    b. yi   xie   (ge)   xuesheng
        one   some   (CL)   student
        'Some students'

In the next two sections, I discuss the recent proposals on *xie*, and discuss shortcomings of those proposals.

3.2. *Xie* as a dividing numeral

Borer (2005) proposes that *xie* is a dividing numeral such that it originates in Div as a divider, and it moves to a # position where an English-type numeral merges (see section 2), as illustrated in (15) for the example *xie shu* 'some books'.

(15) [#P   # *xie*   [DivP   Div *<xie>*   [NP *shu*]]]
                       'some'   'book'

Following Cheng and Symbesma (1998, 2000), *xie* is assumed to be a (plural) classifier, and thus it instantiates a Div head. Consider the data in (16) and (17).

(16) wo   xiang   mai   ben   shu
     I   want   buy   CL   book
     'I would like to buy a book.'

(17) wo   xian   mai   xie   shu
     I   want   buy   CL^{pl} book
     'I would like to buy some books.'

                                          (Cheng and Sybesma 2000)

In (16), *ben* is a classifier that appears with a noun such as *shu* 'book'. As shown in this example, a noun in Chinese is interpreted as singular when it appears with a bare classifier.[8] On the other hand, *xie*, which is proposed to be an indefinite classifier in Cheng and Sybesma (2000), yields a plural reading only, as illustrated in (17). Thus, *xie* is referred to as a plural classifier (CL^{pl}) in Cheng and Sybesma (2000). As the gloss indicates, *xie* also has a quantity reading 'some'; given this type of quantity reading, Borer (2005) suggests that *xie* must move to # from Div.

Under this view, *xie* plays a dividing role similar to a usual classifier like *ben* in (16). It also has a quantifying function as its interpretation suggests, and thus it appears in #. According to Borer (2005), this view captures the fact that *xie* cannot appear with other numerals, as illustrated in (18a). In (18a), the numeral *san* 'three' indicates the quantity of the noun *shu* 'book', but *xie* is ungrammatical with the numeral. The ungrammaticality contrasts with the grammaticality of the usual classifier *ben* as in (18b). According to Borer (2005), a numeral that belongs to the quantificational domain is not allowed with *xie*, as *xie* also occupies the quantificational domain #P.

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8) In Borer (2005), a bare classifier such as in (16) is analyzed as realizing Div and moves to the # head, similar to the indefinite article *a* in English (see (9)). Like an English article, a bare classifier counts a divided noun, giving rise to a singular entity.

(18) a. *san   xie   shu
          three   CL   book
          'Intended meaning: 'three books'
     b. san   ben   shu
          three   CL   book
          'Three books'

In section 4, I reject Borer's proposal, and propose that *xie* originates as a # head that has a specific type of complement, namely DivP (see section 4). In this section, I mention two reasons for the objection. First, the argument that *xie* and a numeral cannot co-occur as they both appear in the quantification domain #P does not appear to be sufficient to capture the incompatibility of a numeral and *xie* in (18a). In Borer's approach, a numeral in Chinese appears in the specifier of #P (see section 2); for instance, a numeral *san* in (18a) will appear in the specifier of #P. In (15), where *xie* is proposed to end up on a # head, the specifier of #P would be available for a numeral; therefore, co-occurrence of numeral and *xie* would be expected to be grammatical, contrary to fact (18a). Moreover, proposing *xie* as a numeral seems to be incorrect. As will be shown in section 4, *xie* cannot be characterized as a numeral, as it does not play the role of counter unlike a usual numeral.[9]

3.3. *Xie* as Num [+PL]

Yang (2005) proposed that *xie* is a plural marker and as such it merges in Num (in the sense of Ritter 1991), as illustrated in (19c):

(19) a. na   xie   shu
          that   some   book
          'those books'/*'that book'

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9) It is not clear why *xie* is proposed to be a 'numeral' in Borer (2005), as no direct account has been provided; it may be because *xie* appears in #P like a numeral, which I do not further question.

    b. na   shu
       that   book
       'that book'

    c. [$_{DP}$ D *na* [$_{NumP}$ Num [+PL] *xie* [$_{CLP}$ CL(*ge*) [$_{NP}$ *shu*]]]

In structure (19c), *xie* instantiates the [+PL] feature on Num, which yields a plural reading when it occurs with a noun such as *shu* 'book', as shown in (19a). Yang's (2005) evidence comes from the difference in interpretation when *xie* is present and absent. As indicated in (19a), a singular reading is not allowed in the presence of *xie*. In contrast, in the absence of *xie*, a singular reading is available as in (19b).

   Moreover, *xie* can co-occur with the classifier *ge* as shown in (20), although *ge* is optional. As illustrated in (19c), *ge* instantiates a CL head that appears in a lower position than Num, which captures the compatiblity of *xie* and the classifier *ge*. Building on this compatibility, Yang (2005) argues that *xie* cannot be viewed as a classifier, which is also pointed out in Iljic (1994), unlike Li and Thompson (1989), Cheng and Sybesma (2000), Norman (1988), and Li (2003). When *ge* is absent, on the other hand, CL is proposed to be semantically vacuous and merely a phonological place holder. Thus, in the proposed structure for *xie* in (19c), a null CL is present when *ge* is absent.

(20) zhe xie   (ge) xuesheng
     this some CL   student
     'these students'   (Li 2003)

The proposal that *xie* cannot be a classifier head is also supported by the fact that in Chinese two different classifiers are not allowed to co-occur, as shown in (21). Either *wei* or *ge* can be used as a classifier for the noun *xuesheng* 'student', but not both together, as the ungrammaticality of (21) suggests.[10] If *xie* were a classifier, it would be predicted to be ungrammatical to co-occur with another classifier *ge*, contrary to the fact (20).

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10) The classifier *wei* is a more respectful version than the classifier *ge*.

(21) *zhe   wei   ge   xuesheng
     this   CL   CL   student
     Intended meaning: 'these students' (Adopted from Yang 2005)

In Yang (2005), the [+PL] feature on Num indicates plurality, while CL denotes 'singularities', not 'singular', which is represented by the feature [+SG]. The feature [+SG] refers to a set of atomic individuals, while singular denotes a single entity. In Yang (2005), the feature [+SG] is indicated on Num, despite of indicating the semantics of CL. This is illustrated in the schematic structure (22b).

(22) a. san   ben   shu
       three   CL   book
       'Three books'
     b. [$_{\text{NumP}}$ *san* Num [+SG] [$_{\text{CLP}}$ CL *ben* [NP *shu*]]]
          'three'   'book'

In structure (22b), a numeral appears in the specifier of NumP. According to Yang (2005), a Num head with the [+SG] feature does not interfere with the interpretation of a numeral larger than one. For example, a numeral larger than one such as *san* 'three' indicates plural, but the plural semantics is compatible with the feature [+SG] on Num, as the grammaticality of the example in (22a) suggests. Although a specific explanation why this is so has not been provided, it seems that the feature [+SG] is not an opposite correspondence to the feature [+PL] instantiated by *xie*. In other words, the feature [+SG] does not indicate singular as opposed to plural; therefore, [+SG] on Num seems to be compatible with numeral larger than one such as *san*, which denotes plural meaning.

   However, this view seems to raise incorrect predictions and some confusion. For example, Yang's account for the well-known ungrammaticality regarding *xie* as shown in (23) seems to be problematic with his proposed structures in (19c) and (22b). In (23), *xie* appears with the CLP *san ben shu* 'three books', which is ungrammatical. This data is puzzling in that *xie* as a plural marker is not compatible with a CLP

where the numeral is larger than one. According to Yang (2005), the ungrammaticality of (23) is due to having two features on a single head, Num: CLP denotes [+SG] reflected on Num but *xie* instantiates [+PL] on Num. Num cannot hold two features [+SG] and [+PL] together, and thus the ungrammaticality as in (23) results in.

(23) *na   xie   san   ben   shu
      that   some   three   CL   book
      Intended meaning: 'those three books'

However, this account of the ungrammaticality seems to pose an internal problem to Yang's (2005) proposal. Yang proposed that the feature [+SG] does not interfere with plural meaning, as discussed above regarding the structure in (22b): a numeral that indicates plural is compatible with the feature [+SG] on Num. More specifically, the feature [+SG], as defined in Yang (2005), does not indicate an opposite value to [+PL]. The feature [+SG] indicates that CLP denotes a set of atomic individuals. In the presence of a numeral, a corresponding number of individual indicated by the numeral can be extracted from the set. Suppose with *san* 'three' we take 3 individuals from the set denoted by the CLP, which results in a set that consists of atomic sums of three, i.e., plural, and Num in this case has the [+SG] feature. In this view, the feature [+SG] on Num is compatible with plural. Thus, it is not clear why the two features, which are not conflict in meaning, cannot co-occur, and the un-grammaticality of (23) remains unexplained.

   A more serious problem with Yang's proposal is that no justification has been provided as to why Num, the locus of number, bears either [+ PL] or [+ SG (Singularities)], which are not opposite feature values. In the standard case of Num, Num holds either [+plural] or [-plural] which yields a plural or singular reading of the noun in question. In Yang's proposed structure, it is not clear how singular reading (of a bare noun in Chinese) can be accounted for in the absence of a [-plural]-type feature. Finally, it is not clear why the semantics of CLP should be represented on the Num head.

In this section, I showed that *xie* as a dividing numeral as in Borer (2005) and *xie* as a plural marker instantiating Num head in Yang (2005) are not favored for the reasons discussed for each case. In what follows, I propose that *xie* is a quantifier without a counting function.

4. Analysis: *Xie* as a Non-Counting Quantifier

In this section, I propose that *xie* is a quantifier instantiating a # head but does not have the role of counting, unlike a numeral. Moreover, I propose that *xie* is neither an English type of plural marker nor a standard classifier in the language. The proposed structure of *xie* is illustrated in (24).

(24) [#P (*yi*) # *xie* [DivP   Div (*ge*)   [NP   N]]]

Unlike in Borer (2005), *xie* does not originate as a Div head, as it does not have dividing function, unlike a standard classifier. The first piece of evidence that *xie* cannot be on a Div head is the fact that it can co-occur with a general classifier *ge*, as noted in Yang (2005) and also in Iljic (1994) (see (20) in section 3.3). Also, as noted in Yang, Chinese does not allow the co-occurrence of two different classifiers (see (21)). If *xie* were a classifier, it would be unable to co-occur with *ge*, which is not the case. Thus, *xie* cannot be realizing a Div head, instantiated by a classifier in the language. The current proposal that *xie* cannot be a Div head, which is realized by English plural maker *-s*, suggests that *xie* cannot be a plural marker, contra Yang (2005).[11]

In the proposed structure in (24), *xie* takes DivP as a complement, and Div can be realized with the classifier *ge* or can be null. I propose that the semantics of Div in both cases is purely division, devoid of the specific unit information indicated by a usual classifier such as *ben*, the classifier for the noun 'book', or *zhi*, the classifier for a noun such as *bi* 'pen'. For instance, *ben* indicates a unit of volume. As such, it can

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11) In fact, *xie* does not yield the usual plural reading of the noun that it appears with, unlike plural *-s*. Rather, it quantifies a noun as indicated by its meaning 'some'.

appear with nouns referring to 'book' or 'note', but not with a noun like *ren* 'person'. The classifier *ge* is known as a general classifier in that it can appear with a noun without any other classifiers or can be employed as an alternative to another classifier (Iljic 1994). A similar view has been found in experimental studies (Myers et al. 1999a, b). The studies showed that *ge* is a default classifier lacking lexical semantics, e.g., information on the unit of division proposed in this paper, unlike other standard classifiers in the language. For example, the classifier *ben*, which denotes a unit of volume, can appear with *shu* 'book', which can be divided by volume (see (18b)). However, it cannot appear with an object such as 'car' (25a) that cannot be divided by volume. A similar case is shown with classifier *liang* that indicates a unit of vehicle such as 'car', as illustrated in (25b). Thus, this classifier will not be allowed with a noun that cannot be divided by a unit of vehicle, as shown in (25c).

(25) a. *san   ben   chezi
          three   CL   car
          Intended meaning: 'three cars'
     b. san   liang   chezi
          three   CL   car
          'Three cars'
     c. *san   liang   ren
          three   CL   person
          Intended meaning: 'Three people'

As for the classifier *ge*, it does not have this type of semantics. In other words, *ge* does not indicate the type of unit for the noun that it appears with, as supported by its distribution with a wide range of nouns, as illustrated in (26). As in (26a), it can appear with an abstract notion *goujia* 'country', with a person *ren* (26b), or a vehicle *chezi* 'car' (26c).[12]

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12) According to a reviewer, the co-occurrence of *ge* and *xie* may be more restricted than presented here, being limited to a noun such as *ren* 'person'. With the speakers that I consulted, the use of *ge* with *xie* is allowed not only with *ren*, but also with other nouns that indicate an object or a thing such as *zhi* 'paper' (see section 3). Due to the scope of this paper, I leave more thorough investigation of this issue for future research.

(26) a. yi   ge   goujia
       one   CL   country
       'a country'   (Myers et al. 1999a)

    b. yi   ge   ren
       one   CL   person
       'a person'

    c. yi   ge   chezi
       one   CL   car
       'a car'

Lacking the information on the unit, I propose that what is left for classifier *ge* should be the meaning inherent to a classifier, namely division.

When *ge* is absent, Div is null but its function as division is intact, similar to when *ge* is present. This argument is based on Iljic (1994) who suggested that *xie* appears with a noun phrase whose ontological meaning is countable or discrete. For example, *xie* is not compatible with a mass noun such as *shui* 'water' (27), in contrast to its compatibility with a noun *ren* 'person' that is countable (27b).

(27) a. *zhe   xie   shui
        this   some   water
        Intended meaning: 'some water'

    b. zhe   xie   ren
       this   some   person
       'Some people'

Interestingly, however, *xie* can have a grammatical reading with a mass noun. For example, (27a) is grammatical when it has an interpretation such as 'different trickles of water' or 'different qualities of water' (Iljic 1994). As these grammatical interpretations suggest, *xie*, when it appears with a mass noun, results in pluralities that are divisible. I take this fact to suggest that *xie* takes a nominal complement that is divided.

Implementing this proposal syntactically, I argue that *xie* as a # head takes DivP as a complement, where Div can be null. Without the presence

of a standard classifier, a null Div has the semantics of a divider devoid of the unit of division, just like when *ge* is present in Div. In formalizing this type of Div, I assume that the feature [class(ification)] is imposed by a standard classifier, as also proposed in Cowper and Hall (2012). A standard classifier, in addition to division function, also specifies a unit of division, represented by a [class] feature; for example, Div realized by a classifier *ben* has a [class] feature such as volume.[13] In contrast, Div realized by *ge* or a null Div, the complement of *xie*, lacks such a feature. This aspect of the proposal captures the fact that in the absence of *ge*, other classifiers are not allowed with *xie*, as shown in (28). *Xie* cannot appear with classifiers such as *ben* (28a) or *zhi* (28b). This is because *xie* takes a DivP complement whose head does not have a [class] feature, but the classifiers in (28) realize Div that has a [class] feature.

(28) a. *zhe   xie   san   ben shu
           this   some   three   CL   book
           'Those three books'
     b. *Zhe   xie   liang   zhi bi
           this   some   two   CL   pen
           'Those two pens'

In the proposed account, *xie* is a non-counter, which is a logical consequence of not instantiating Div. *Xie* has a DivP complement that does not have information about the unit, which follows from the proposed property of *xie*, being a non-counter. In a classifier language such as Chinese, for a noun to be counted, a classifier must appear. In the present paper, a classifier instantiates a Div head with [class] feature; thus, *xie*, as a non-counter, should select Div without [class] feature. Div without a [class] feature denotes a divided nominal, but it does not indicate into what type of unit the nominal is divided. For example, a classifier *ben* indicates that a nominal that it appears with should be divided into volumes. Thus, when the nominal is counted by a numeral, the nominal

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13) For example, this may be represented as [class: volume]. In other words, assuming minimalism (Chomsky 2000), the feature [class] may be valued for a specific unit.

is counted by volume. In the case of a noun that appears with *xie*, the noun is divided but without the information on which unit it should be divided into. In the absence of units of division, thus, the noun cannot be counted by unit, disallowing a numeral such as *san* 'three', as shown in (29a).

(29) a. *san   xie   shu
      three   some   book
     'Three books'
   b. (yi)   xie   shu
      IND   some   book
     'some books'

Thus, the ungrammaticality of (29a) supports the current proposal that *xie* is a non-counter. I further propose that the *xie* phrase indicates indeterminate number. Evidence comes from the fact that *xie* is compatible with an optional indeterminate number marker *yi*, glossed as IND, as shown in (29b). In its standard use, *yi* is a numeral meaning 'one'. However, it does not mean a numeric value of one when it appears with *xie*, as indicated in (29b): *yi* does not contribute singular meaning to the whole phrase. Rather, the interpretation of the quantifying phrase headed by *xie* is plural in number. In particular, its number is indeterminate, i.e., 'some'. I propose this is why a *xie* phrase can appear with *yi*, which is proposed to be an indeterminate number marker in Yang (2005). Evidence that *yi* is an indeterminate number marker comes from reduplicated plural forms in the language. In Chinese, one of the means to pluralize a given nominal is reduplication of classifier, as illustrated in (30). In (30a), the reduplicated form of the classifier *zhang* appears, and *yi* precedes the reduplicated form. The meaning of (30a) is plural, not singular, as indicated in the interpretation. Note that plural meaning in (30a) is also possible without *yi*, which is optional just like *yi* that appears with *xie* in (29b). Similar to *yi* that appears with *xie* (29b), *yi* that appears with reduplicated classifiers does not provide singular meaning, i.e., it is not a standard numeral that bears the counting function.[14] This is

further supported by the ungrammaticality that results if a numeral larger than one such as *san* appears in the place of *yi* with the reduplicated plural forms, as shown in (30b), which is in parallel to the *yi* that appears with *xie* (see (29a)). The numeral *san* 'three' is a counter, and thus it is ungrammatical with reduplicated classifiers, which have no determined number value.[15]

  (30) a. (yi)   zhang zhang zhi
          IND CL   CL   paper
          'the pieces of paper.'/ * 'one piece of paper'
       b. *san   zhang zhang zhi
           three CL   CL   paper
           Intended meaning: 'Three pieces of paper.'   (Yang 2005)

Given the distribution of *yi* in (30), *yi* is proposed to be an indeterminate number marker (Yang 2005). As with Yang (2005), I also treat *yi* in *xie* quantifier phrases as an indeterminate number marker. Under this view, *yi* is not a usual numeral such as 'one', and thus *yi* in (29b) does not have a counting function. This proposal for *yi* is compatible with the current proposed account of *xie* as a non-counting quantifier. From this proposal, it follows that as a non-counter, *xie* does not allow other numerals which have determined numeric values, but allows *yi*, whose number is indeterminate. In syntax, an indeterminate number marker *yi* merges in the specifier of #P (see (24)), as it quantifies a noun that it appears with.

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14) A reviewer suggested that *yi* in (30a) maybe used as a numeral 'one'. For example, in (30a), *yi zhang zhang* could indicate two occurrences of 'one piece' resulting in plural meaning shown in (30a), and in this case, *yi* may play a role of numeral. It is not clear whether this type of interpretation can hold generally for reduplicated classifiers in Chinese. However, what is clear is that *yi* in a reduplicated classifier context as in (30a) cannot be syntactically numeral, as it does not share the same syntactic properties as a numeral *yi* 'one' (Yang 2005). Thus, *yi* in an example such as in (30a) may not function as a numeral.

15) For the purpose of the paper, I do not pursue the question of how to analyze reduplicated classifiers, but see Yang (2005) for details.

5. Consequences

In this section, I focus on two consequences emerging from the current proposal for *xie*. One is a consequence of the analysis for the typology of # in a nominal structure, and the other is an implication for the mass/count distinction, which is much debated in the literature.

5.1. Situating *xie* in a typology of quantifiers (#)

Under the proposed account, a *xie*-type quantifier is not found in the typology of quantifiers (#) proposed in Borer (2005). In particular, in her system, DivP is necessary in order to count (#P) but not vice versa. In order to count, e.g., via a numeral, a nominal expression has to be divided: structurally, this relation is represented such that #P takes a DivP complement, as exemplified in (31a). However, #P does not always require DivP, as illustrated in (31b): #P can take a mass nominal without division as a complement. In this case, #P quantifies the nominal rather than counting it.

(31) a. [$_{\#P}$ # [$_{DivP}$ Div [$_{NP}$ N]]]
     b. [$_{\#P}$ # [$_{NP}$ N]]

These two types of quantifiers - counting (31a) and non-counting (31b) - are found in English, as shown in Table 1 below. In this table, the typology of English # discussed in Borer is summarized with the addition of Chinese classifiers and *xie*.[16]

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16) In Borer (2005), quantifiers are classified with two dimensions, [± counter] and [± divider], and more quantifiers (from other languages as well) than those presented here are discussed. For the purpose of the paper, I discuss relevant quantifiers only. What is important to the current discussion is that a *xie*-type quantifier is not found in Borer's typology.

Table 1. Typology of # in Borer (2005) and Chinese *xie*

	Types of #		DivP complement	Counting function
English	(i) numeral	Yes	Div - Instantiated by -s	yes
	(ii) *a few* type	Yes		yes
	(iii) indefinite *a*	Yes		yes
	(iv) *much* type	No	N/A	no
Chinese	(v) numeral	Yes	Div [class] - Instantiated by a classifier	yes
	(vi) *xie* type	Yes	Div - optionally instantiated by *ge*	No

Numeral (i), *a few*-type (ii), and indefinite marker *a*-type (iii) quantifiers belong to the set of counting quantifier #s as figured in (31a), while *much*-type (iv) quantifiers belongs to the set of non-counting quantifier #s as shown in (31b).[17] For instance, in a structure such as *a few boys*, #P has a counting function when # is merged with *a few*. As indicated in (ii), this # requires DivP: compare *a few boys* vs. **a few boy*. In order for *a few* (#) to count, DivP realized by plural *-s* should appear as the complement of *a few* (#). On the other hand, with *much* as in *much salt,* #P does not have counting function and thus no DivP is required (iv).[18] In this case, DivP should not be projected, as the ungrammaticality of such projection (realization of plural *-s*) suggests as in **much salts*. It should be noted that Div in English-type languages does not have specific information on the division of unit, unlike Div in the Chinese type that is instantiated by a usual classifier: Div in an English-type plural, and Div [class] in a Chinese-type classifier.

In Borer's typology, the Chinese *xie* type of quantifier is not attested. *Xie* does not have a counting function, like the quantifier *much* (iv).[19]

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17) The difference between (i)/(ii) and (iii) is that the indefinite marker *a* in (iii) plays the roles of both division and counting. See section 2 for details.

18) As with *much*, #P is projected as it quantifies a nominal expression that it appears with. The counting function is one of quantifying functions expressed by #P.

19) The proposed typology regarding *xie* would be further supported by the presence of non-counting quantifier in other languages, which I leave for future research. For

Unlike *much*, however, it requires a division of mass to quantify, namely a DivP complement, similar to the quantifier *a few* or a numeral. Language internally, *xie* is similar to a usual numeral (v) in that it appears in #P domain; however, it requires a DivP stripped of specific class information (32a) (similar to an English-type DivP (32b)), unlike a numeral in the language, which requires a DivP with class information (32c).

(32) a. zhe   xie   [DivP   Div (ge)   shu]
        this   some   (CL)   book
        'These books'
   b. three [DivP   Div -s   book]
   c. san   [DivP   Div [class] ben   shu]
        three   CL   book
        'Three books'

It may seem surprising that even in a classifier language such as Chinese, a DivP without any class information similar to an English-type DivP is attested. However, Div as proposed in Borer (2005), in the absence of a [class] feature, is expected to have only a single function, namely division.[20]

5.2. Count and mass distinction and non-counting quantifier *xie*

Pushing further the claim that a Chinese-type noun is mass (Chierchia 1995), Borer (2005) proposes that all nouns across languages are mass. A syntactic consequence of this is that all nouns need to be portioned

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-tul in Korean, it may be difficult to be grouped together with *xie*, as *-tul* shows different syntactic properties from those of *xie*. For example, in a recent study, *-tul* is proposed to be a plural marker that adjoins to a *n*P as a modifier (Kim and Melchin to appear). As such, unlike *xie*, plural *-tul* is predicted to co-occur with a classifier, which is the case in the language (Kim and Melchin to appear).

20) In recent studies (Mathieu 2012, 2014), it has been shown that the content (i.e., 'flavor' in Mathieu 2012) of Div may vary across languages, and these different flavors of Div are realized with different types of plural. It has been argued that the English-type plural *-s* and Chinese-type standard numeral classifiers are different 'flavors' or contents that Div can take. Under this view, a [class] feature may be one of the contents that Div can have.

out (i.e., divided) in order to interact with the count system. Under this view, the mass/count distinction should be understood at the structural level, not at the lexical level, as argued in Borer (2005). As for count, it is a structural product: Div is projected over a mass expression, and counted via the projection of quantifying head # (33a).[21] As for mass, it is lacking the Div projection, although it can be quantified (e.g., *much salt*) (33b).[22]

(33) a. count structure
    [#P # [DivP Div [NP N]]]
  b. mass structure
    [#P # [NP N]]

This view on the mass/count distinction appears to be in contrast to the proposal in Cheng and Sybesma (1998, 2000) proposed for Chinese. They argued that in Chinese the mass/count distinction is encoded at the lexical level, which is also pointed out by Borer (2005). In Cheng and Sybesma (1998), mass nouns are selected by a classifier referred to as a massifier, while count nouns are selected by a classifier referred to as a count-classifier. These classifiers are illustrated in (34a) and (34b) respectively. In (34a), *ping* 'bottle' is a massifier which creates measure for a mass nominal such as *jiu* 'liquor'. In (34b), on the other hand, *zhi* is a count classifier which merely names the unit of the noun that it appears with. The noun *bi* 'pen' in (34b) is ontologically a count noun, and there is a natural unit to count pens. In this case, the count classifier *zhi* just names this unit, and does not create any measure for the noun.

(34) a. san   ping   jiu
        three   CL.bottle   liquor
        'three bottles of liquor

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21) When #P is not present in a structure such as in (33a), but a DP projects above DivP, the resulting structure is that of bare plurals in English (Borer 2005). As this is not directly relevant to the purpose of this paper, I do not discuss this issue.
22) Note that mass structure in (33b) is one of the ways in which mass can surface; for example, without #P, (33b) is still mass.

b. san   zhi   bi
   three   CL   pen
   'three pens'   (Cheng and Sybesma 1998)

They further propose that count-classifiers make a noun countable as they single out one countable discrete unit. However, massifiers do not make a noun countable, but instead with the addition of massifiers the noun is still a mass. This is because in Cheng and Sybesma (1998), a massifier is considered not to single out a discrete unit of the noun.[23] Consequently, the mass/count distinction is visible at the lexical level such that different types of classifier are selected by an ontologically mass or count noun.

 However, the proposed account of *xie* in this paper supports the structural mass/count distinction advocated in Borer (2005), rather than the lexical view in Cheng and Sybesma (1998). The quantifier *xie* selects a discrete noun represented by DivP, where Div is realized either by *ge* or by a null morpheme. This suggests that *xie* takes a structurally count complement. It cannot be viewed that it selects ontologically count nouns, as evidenced by the fact that it can occur with a mass noun such as 'water' as mentioned earlier. When *xie* appears with a mass noun, the noun has a particular interpretation, as illustrated in (35).

(35) zhe   xie   shui
     this   some   water
     'these different trickles of water'   (Iljic 1994)

The compatibility with mass nouns is not limited to 'water', but this compatibility is productive, as illustrated in (36). Importantly, the interpretations of these examples are count, i.e., divided, not mass, as indicated in the translation, which provides support for the proposed analysis of *xie* in this paper. For instance, in (36a), *xie* appears with the mass noun 'snow'. However, this phrase is understood as individualized snow; for

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23) No further explanation has been provided for this proposal. Presumably, this may be because a unit denoted by a massifier is still mass in Cheng and Sybesma's view. For example, one bottle of liquor taken as a whole is still mass.

example, (36a) can be understood in a context where a man brought some snow taken from different mountains, and presented them into different containers respectively.[24] The phrase cannot be understood as a whole in a context such as 'these snows fell on to me' where 'these snows' is taken as a pile of snow.

(36) a. zhe   xie   xue
   this   some   snow
   'these individualized snows'/*'these snow as a whole'

  b. zhe   xie   tu
   this   some   soil
   'these individualized soils'/*'these soils as a whole'

  c. zhe   xie   rou
   this   some   meat
   'these individualized meats'/*'these meat as a whole'

These data show that *xie* can appear with lexically either a count or a mass noun, but it has to take a structurally count phrase, namely DivP. This suggests that *xie* is inert with respect to the lexical mass/count distinction, but it distinguishes a structural count phrase from structural mass phrase. Thus, the proposed account supports the structural view of the mass/count distinction, not the lexical one.

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24) A reviewer pointed out that *duo* 'all' can appear with examples such as in (36), but not with *gege* 'every'. Consider the following example in (i) where (36a) is embedded in a sentence. As shown in (i), *duo* is grammatical to appear; however, *gege* cannot appear in the position of *duo*. The reviewer suggested that the grammaticality with *duo*, but not with *gege,* may indicate that a *xie* phrase may not strictly denote individuals, unlike the proposal made in this paper.

(i) zhe   xie   xue   dou /*gege   hua   le
 This   some   snow   all /every   melt   ASP
 'These snows are all melted.'

However, settling this issue seems to be less straightforward than it appears. For example, *duo* cannot appear in a nominal context; thus, **zhe xie xue dou* (intended meaning: 'all these snows') is ungrammatical. Moreover, as indicated in the gloss in (i), *duo* is interpreted as a modifier of event denoted by the verb phrase, rather than of the nominal subject. As pursuing this issue goes beyond the scope of this paper, I leave it for further research.

6. Conclusion

This paper examined the distribution of the quantifier *xie* in Chinese in the perspective of the recent proposed nominal structure in Borer (2005). Contrary to the previous approaches to *xie*, it is shown that *xie* can be neither an English-type plural morpheme nor a standard classifier in the language, both of which are proposed to be instantiated by Div in Borer (2005).

The provided evidence in this paper supports the current analysis of *xie* as a non-counting quantifier. More specifically, it is demonstrated that *xie* cannot be a classifier, and thus it cannot realize a Div head. Also, *xie* is shown to take a divided mass as a complement, namely DivP. The type of DivP that appears with *xie* is lacking the information on the unit of division, and formally this type of Div is proposed to lack a [class] feature. This aspect of the proposed analysis suggests that Div in the absence of a [class] feature performs its pure function, i.e., division. Another important consequence of the current proposal for *xie* is the support for the view that the mass/count distinction, if it exists at all, should be encoded structurally rather than lexically, thereby contributing to the ongoing discussion on the count/mass distinction in the nominal domain (e.g., Chierchia 1998; Krifka 1995; Borer 2005; Doetjes 2012; Bale and Coon 2014).

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