

# Numeral classifiers compete with number marking: Evidence from Dafing

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## 1 Introduction

- (1) *The Sanches-Greenberg-Slobin Generalization* (Greenberg 1977, Doetjes 2007)  
“If a language includes ...numeral classifiers, then it will also have facultative expression of the plural. In other words it will not have obligatory marking of the plural on nouns.”
- (2) English: Obligatory plural language  
*three dog-s*
- (3) Thai: Numeral classifier language  
*thúrian sām lúuk*  
durian three CL:FRUIT  
‘three durian’
- (4) Dafing (Mande: Burkina Faso): Plurals and classifiers
  - a. *wúru=rú*  
dog=PL  
‘dogs’
  - b. *wúru dèn flá*  
dog CL:-HUM two  
‘two dogs’
  - c. \**wúru-rú flá*  
dog-pl two
- (5)
  - a. Borer (2005) and Nomoto (2013) argue that classifiers and plural markers occupy the same syntactic position to mark number: Num/Clf/Div.
  - b. This proposal is supported by the complementarity of plurals and classifiers in Dafing (4-c) and W. Armenian (Borer 2005).

- (6) *Goals of this paper*
  - a. To show that Dafing provides evidence for Borer’s analysis of classifiers as Num heads.
  - b. To show that this analysis permits an explanation of the Sanches-Greenberg-Slobin Generalization:

- (7) *Numeral classifier conjecture*: Numeral classifiers only occur in the absence of N<sup>0</sup>-to-Num<sup>0</sup> movement<sup>1</sup>

- a. “Number-marking language”    b. “Numeral classifier language”



- (8)
  - a. *Consequence 1*: Num can be pronounced as a numeral classifier
  - b. *Consequence 2*: Nouns remaining in N can have *general number* (Corbett 2000), i.e., are number neutral, (cf. Greenberg 1977, Chierchia 1998).
  - c. *Consequence 3*: Plural marking is not a nominal affix, it will have a marked plural interpretation.

<sup>1</sup>This idea is only novel in its specific formulation. For closely related proposals, compare Doetjes (1997), Cheng and Sybesma (1999), Borer (2005) and Nomoto (2013).

## 2 Dafing as a numeral classifier language

- (9) a. Mande languages are mostly head-final except for a head-initial TP.  
 b. Numeral classifiers have not been previously documented in any Mande languages, so we should proceed with caution.
- (10) Noun phrase order: N-Adj-Clf-Num-Dem
- a. *mètárí zánzàn 'míí*  
 teacher tall this  
 'this tall teacher'
- b. *mètárí zánzàn m'ó 'sábá*  
 teacher tall CLF three  
 'three tall teachers'

### 2.1 Numeral classifiers in Dafing

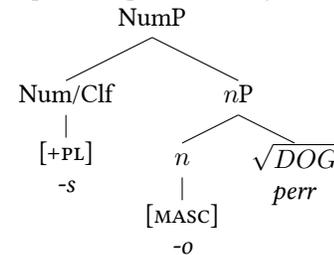
- (11) Dafing has two sortal numeral classifiers ('count classifiers')
- a. *dèn* non-humans optional derived from *dèn* 'child'  
 b. *m'ó* humans obligatory derived from *m'ó* 'person'
- (12) Diagnostics for count classifiers (vs. noun classifiers cf. Aikhenvald 2000)
- a. Occur with numerals  
 b. Are distinct from nominalizing/*n* heads  
 c. Are parasitic on constructions used for measuring (Cheng and Sybesma 1998, Rothstein 2011) and kind reference (Nomoto 2013)  
 d. Impossible with mass nouns (Cheng and Sybesma 1999, Doetjes 2012)
- (13) Dafing count classifiers occur with numerals
- a. *wúró (dèn) flá/(='ó'ó)*  
 dog CL:-HUM two(=DEF)  
 '(the) two dogs'
- b. *k'ó: \*(m'ó) 'flá/(='ó'ó)*  
 father CL:+HUM two(=DEF)  
 '(the) two fathers'
- (14) *n*-heads such as the agentive nominalizer *bàà* can co-occur with classifier
- a. *níé-só b'ò*  
 bicycle ride  
 'ride a bike'
- b. *níé-só-b'óí-bàà*  
 metal-horse-ride-AG.NOM

- c. 'bike-rider'  
*níé-só-b'óí-'báá m'ó 'flá*  
 metal-horse-ride-AG.NOM CL:+HUM two  
 'two bike-riders'

- (15) Identical constructions are used for measure classifiers (15-b-c)
- a. *tómàtì kilóó s'ábá*  
 tomato kilo three  
 'three kilos of tomatoes'
- b. *tómàtì b'ót'ó 'sábá*  
 tomato bag three  
 'three bags of tomatoes'
- (16) Count classifiers are impossible with mass nouns
- a. *z'è f'j'èrén flá*  
 water cup two  
 'two cups of water'
- b. \**z'è dèn flá*  
 water CL:-HUM two

### 2.2 Analysis of numeral classifiers

- (17) Inflected nouns can be split into three separate projections
- a. Spanish: /perr-o-s/ 'dogs'

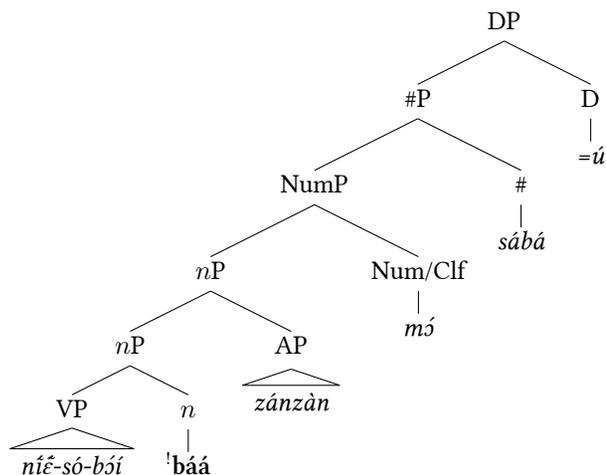


- b. *n* hosts gender (Kramer 2015) and uninterpretable number features (Wiltschko 2008, Harbour 2011, Kramer 2016).
- c. Num is the locus of *interpretable* number features (Harbour 2011, Kramer 2016) and of count classifiers (Borer 2005).

(18) In a classifier language like Dafing, Num is spelled out as a count classifier:<sup>2</sup>

- a. níě-só-bóí -'báá zánzàn 'mó 'sábó = 'ó  
 metal-horse-ride -AG.NOM tall CL:+HUM three =DEF  
 'the two tall bike-riders'

b.



### 3 Plurality in Dafing

(19) Recall the claim from (7), lightly revised:

If a language has numeral classifiers, then there is no  $n^0$ -to-Num<sup>0</sup>/Clf<sup>0</sup> movement

- a. *Consequence 1:* Dafing allows free-standing classifiers because  $n$  doesn't move to Num;<sup>3</sup> Num- $n$  never form a morphological word.  
 b. *Consequence 2:* Dafing bare  $n$ Ps are possible, and should allow general number interpretations (Deprez 2005, Wiltschko 2008)  
 c. *Consequence 3:* Plural marking is not a nominal affix and will have a marked plural interpretation.

<sup>2</sup>I am assuming that numerals are heads in Dafing, see e.g. Cheng and Sybesma (1999), Borer (2005), Ionin and Matushansky (2006), Simpson (2005).

<sup>3</sup>For arguments for N-to-Num movement in English, see, e.g., (Wiltschko 2008).

### 3.1 The distribution of the Dafing plural

(20) The Dafing plural: =ru/nu

- |              |          |                 |            |
|--------------|----------|-----------------|------------|
| <i>músó</i>  | 'woman'  | <i>músó=rú</i>  | 'women'    |
| <i>bà</i>    | 'mother' | <i>bà=rù</i>    | 'mothers'  |
| <i>dèn</i>   | 'child'  | <i>dèè=nù</i>   | 'children' |
| <i>kónin</i> | 'bird'   | <i>kóniì=nù</i> | 'birds'    |

- a. Consonant shape determined by nasality of preceding vowel  
 b. Tone determined by tone of preceding syllable

(21) The plural cannot occur on mass nouns

- |            |         |                 |
|------------|---------|-----------------|
| <i>dóó</i> | 'beer'  | * <i>dóó=rú</i> |
| <i>zè</i>  | 'water' | * <i>zè=rù</i>  |

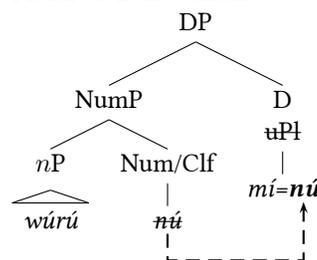
(22) The plural is an enclitic on the noun phrase, which fuses with the definite article:

- a. *wúru* = 'úú  
 dog=DEF.PL  
 'the dogs'
- b. *wúru lwém* = 'ùù  
 dog red=DEF.PL  
 'the red dogs'

(23) The plural attaches to the right of other determiners:

- |   |   |
|---|---|
| a. <i>wúru mí</i><br>dog this<br>'this dog' | b. <i>wúru mí=nú</i><br>dog this=PL<br>'these dogs' |
| c. <i>wúru dò</i><br>dog some<br>'some dog' | d. <i>wúru dò=rù</i><br>dog some=PL<br>'some dogs'  |

(24) Plural-to-D movement:



(25) Plural clitics can't occur with numerals or numeral classifiers

- a. *wúru dèn sá bá*                      b. *wúru dèn sá b́ó='ó*  
 dog CL:-HUM three                      dog CL three=DEF  
 'three dogs'                                      'the three dogs'
- c. \**wúru dèn sá ba='ru*                      d. \**wúru dèn sá b́ó='úù*  
 dog CL:-HUM three-PL                      dog CL:-HUM three-DEF.PL

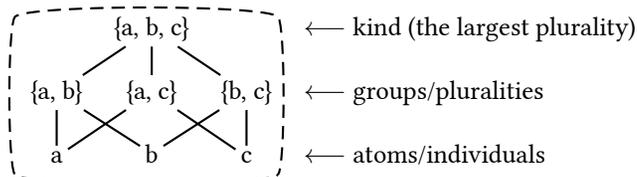
(26) Morphological opposition on Num<sup>0</sup> derives plural/classifier complementarity (Nomoto 2013); modeled with binary ±singular feature (Harbour 2011).

- a. =ru ⇔ [Num, -Singular]  
 b. ḿó ⇔ [Num, +Singular, +Human]  
 c. dèn ⇔ [Num, +Singular, -Human]

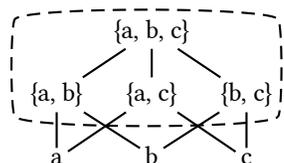
### 3.2 Bare nouns and general number

(27) Extensions of bare nP and [±singular] NumPs:<sup>4</sup>

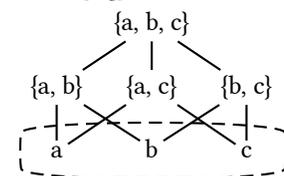
a. Bare nouns = nP: General number



b. NumP<sub>[-sg]</sub>: Only pluralities



c. NumP<sub>[+sg]</sub>: Only individuals



→ Classifiers are necessary with numerals because pluralities get in the way of

<sup>4</sup>See Link (1983), Schwartzschild (1996), Chierchia (1998), Bale and Khanjian (2009), Bale et al. (2011)

counting individuals (Chierchia 1998, Ionin 2006, Bale and Khanjian 2009).

### 3.3 Evidence for general number

(28) Evidence for the semantic claims above:

- a. Existential assertions  
 b. Questions  
 c. Ellipsis

#### 3.3.1 Existential assertions

- (29) a. Bare nouns are used in all low-scope existential assertions, regardless of whether the existence of an individual or group is at issue.  
 b. To the extent that plural nouns are acceptable, my consultant reports they would only be true of groups.

(30) Bare noun vs. plural in existential context

- a. *wúru=ù Hàzàá bé*  
 dog=COP H. at  
 'Hazaa has a dog.' TRUE: if H has one dog.  
 TRUE: if H. has two dogs
- b. ??*wúru=rú=ù Hàzàá bé*  
 dog-PL-cop H. at  
 'Hazaa has dogs.'  
 FALSE: if H has one dog.  
 TRUE: if H. has two dogs

#### 3.3.2 Questions

(31) Questions about existence or possession must use bare nouns, and are felicitous regardless of the number (compare Bale and Khanjian 2009 on W. Armenian):

Context: I want to know if Hazaa has any children.

Q: *dèn Hàzàá bé 'ré kē?*  
 child H. at FOC Q?  
 'Does Hazaa have a child?'

A1: *ǝǝ, dèn ḿó cè nédàn já(← /jì-á/) b́é*  
 Yes, child CLF one FOC-only be-3SG at  
 'Yes, but only one child.'

A2: òòò, dén mós flá já(← /jì-á/) bɛ̀  
 Yes, child CLF two be-3SG at  
 ‘Yes, she has two children.’

### 3.3.3 Bare Argument Ellipsis

Diagnostic: Lexical ambiguity must be resolved across ellipsis contexts (Rullman and You 2006).

- (32) John saw a pen and Mary did too.  
 a. OK: John and Mary saw a writing implement.  
 b. OK: John and Mary saw an animal enclosure.  
 c. \*John saw a writing implement and Mary an animal enclosure.
- (33) Bare argument ellipsis in Dafing:  
 a. Hàzáá ní wúró 'sán  
 Hazaa PFV dog buy  
 ‘Hazaa bought a dog (one or more).’  
 b. Rási fàná.  
 Rasi too.  
 ‘Rasi did too. (bought one or more dogs).’  
 → (33-b) is fine even if Hazaa bought one dog and Rasi bought three.

## 3.4 Summary

- (34) a. Bare *n*Ps include individuals and pluralities in extension.  
 b. Plural NumPs (with =*ru*) exclude individuals, only denote pluralities, due to [−singular] feature in Num.  
 c. Singular NumPs (with classifiers) only include atoms in denotations, the semantic representation necessary for counting in Dafing, due to [+singular] feature in Num.<sup>5</sup>
- (35) a. Similar facts exist in Turkish and W. Armenian, which having semantically marked plurals (Bale and Khanjian 2009, Bale et al. 2011), and may be a general property of Mande languages.<sup>6</sup>  
 b. Both languages have numeral classifiers in limited contexts (Bale and Khanjian 2009, Sag 2016), and hence provide further evidence for Sanches’s Generalization.

<sup>5</sup>See Bale et al. (2011) and Nomoto (2013) for discussion of variation in numeral meanings.

<sup>6</sup>For example, Welmers (1974:p. 214), reports similar facts in Kpelle (W. Mande).

## 4 Classifiers are for nouns (not numerals)

- (36) a. The idea that numeral classifiers are Num heads is linked to the assumption that classifiers are *for nouns*, they enable nouns to be counted (Doetjes 1997, Chierchia 1998, 2010, Cheng and Sybesma 1999, Krifka 2003, Ionin 2006, Nomoto 2013).  
 b. On the other hand, Bale and Coon (2014) argue that numeral classifiers are *for numerals*, i.e. they provide numerals with measure functions (cf. Krifka 1995, Wilhelm 2008, Sudo 2016).
- (37) Bale & Coon’s arguments come from numeral sensitivity, e.g. in Mi’gmaq:  
 a. Mi’gmaq  $n = \{1, 2, 3, 4, 5\}$  cannot occur with numeral classifiers  
*na’n (\*te’s) -ijig ji’nm-ug*  
 five CL -AGR man-PL  
 ‘five men’  
 b. Mi’gmaq  $n > 5$  require numeral classifiers  
*asugom \*(te’s)-ijig ji’nm-ug*  
 six CL-AGR man-PL  
 ‘six men’
- (38) a. Mi’gmaq 1-5 have measure functions built-in, while  $n > 5$  do not.  
 b. Bale & Coon’s argument is convincing, and I concur that classifiers may be for numerals in such languages.
- (39) Two arguments that classifiers are *for nouns*  
*Argument 1*: Noun sensitivity (the counterpart of numeral sensitivity)  
*Argument 2*: Different classifiers have different distributions
- ### 4.1 Argument 1: Noun sensitivity
- If classifiers are *for numerals* in Dafing, the choice of noun shouldn’t matter. But certain nouns can’t occur with numeral classifiers at all:
- (40) Inherent measures noun: *té*: ‘day’  
 a. *té:-rú*  
 day-PL  
 ‘days’  
 b. *té: (\*dèn) flá*  
 day CL: −HUM two(=DEF)  
 ‘two days’

- (41) Compounds formed with the provenancial suffix *-kà*
- bóbóó-kà*  
'boboese, people from Bobo (Bobojulasó)'
  - bóbóó-kà-rù*  
'boboeses, people from Bobo'
  - bóbóó-<sup>l</sup>kà (\*mó) flà*  
'two boboese'  
→ The availability of =*ru* shows that *té*: 'day' and *bóbóó-kà* are nouns.
- (42) If classifiers are *for nouns*, such irregularities are expected: Nouns like *té*: 'day' and *bóbóó-kà* 'a boboese' are semantically partitioned for counting by default, possibly because they lack pluralities in their extension.
- (43) If classifiers are *for numerals*:
- Classifiers would be expected to have the same distribution with all nouns
  - A null classifier cannot save this analysis, since such a classifier for a human noun like *bóbóó-kà* should be available for all human nouns.
- (45) Mensural classifiers like *bótó* 'bag' occur with determiners and plural clitics:
- tómàti bótó flà*  
tomato  $\mu$ :bag two  
'two bags of tomatoes'
  - tómàti bótó vjé*  
tomato  $\mu$ :bag every  
'all bags of tomatoes'
  - tómàti bótó mín*  
tomato  $\mu$ :bag this  
'this bag of tomatoes'
  - ?*tómàti bótó=rú*  
'bags of tomatoes'
- (46) Mensural classifiers cannot co-occur with count classifiers, so they are 'true' classifiers:
- bótó dèn sá bá*  
bag CL:-HUM three  
'three bags'
  - \**tómàti bótó dèn sá bá*  
tomato bag CL:-HUM three

## 4.2 Argument 2: Different distributions of classifiers

Different classifiers have distinct distributions in the noun phrase:

- (44) The subkind classifier *sì* 'kind, group' can occur with determiners like *vjé* 'all' and *mín* 'this', which are impossible with count classifiers:
- wú rú sì flà*  
dog CL:KIND two  
'two kinds/groups of dogs'
  - wú rú sì vjé*  
dog CL:kind every  
'all kinds of dogs'
  - wú rú sì mín*  
dog CL:kind this  
'this kind of dogs'
  - wú rú (\*dèn) vjé*  
dog CL:-HUM all  
'all dogs'
  - \**wú rú sì-rù*  
'types of dogs'
- (47) These facts follow directly if classifiers are *for nouns*:
- Because *sì* 'kind' changes the domain in which the noun refers (Nomoto 2013), it is required for quantification over subkinds.
  - Because measures like *bótó* 'bag' retain their nominal syntax, they can occur either in Clf/Num or as compound nouns.
- (48) These facts are unexpected if classifiers are *for numerals*; we wouldn't expect classifiers to supply predicates for pluralization or to restrict quantifiers.

## 4.3 Classifier-plural competition redux

(49) Recall that plural clitics can't occur with classifiers in Dafing (25):

- |  |   |
|--|---|
| a. <i>wú rú dèn sá bá</i><br>dog CL:-HUM three<br>'three dogs' | b. <i>wú rú dèn sá bó='sù</i><br>dog CL three=DEF<br>'the three dogs' |
| c. * <i>wú rú dèn sá ba='rú</i><br>dog CL:-HUM three-PL        | d. * <i>wú rú dèn sá bó='sù</i><br>dog CL:-HUM three-DEF.PL           |

- (50) Two explanations for classifier-plural complementarity
- Semantics: Dafing plurals and classifiers have contradictory semantics.
  - Syntax: Dafing plurals and classifiers realize different features of Num. → These are not incompatible; they should go together!
- (51) Classifier-plural complementarity follows from the *classifiers for nouns* hypothesis, as both plurals and classifiers are manipulating noun semantics.
- Classifier-plural complementarity is unexpected under the *classifiers for numerals* hypothesis.
  - In contrast, Mi'gmaq and Chol both have plurals co-occurring with numeral classifiers, indicating either that their plurals are uninterpretable, in *n*, that classifiers are for numerals, or both.
- (52) Two kinds of classifier languages?
- Type 1** (Dafing): Plural marking competes with classifiers, which are 'for nouns' (true in most 'traditional classifier languages')
  - Type 2** (Mi'gmaq/Chol): Plural marking does not compete with classifiers, which are 'for numerals'

## 5 Summary

- (53) *Sanches-Greenberg-Slobin Generalization* (final version): In Type 1 classifier languages, plural reference is possible without overt plural morphology on the noun.
- (54) An explanation:
- Numeral classifiers and plural marking occurs in Num in the absence of *n*-to-Num movement.
  - Because *n* does not move to Num in such languages, bare *n*P<sub>s</sub> will be available, which will be interpreted with general number.
- (55) This explanation relies on some unstated assumption:
- Head-movement is always obligatory, leading to obligatory inflection.
  - In contrast, morphologically and syntactically independent heads can be freely omitted, *as long as semantically appropriate*.
  - This proposal offers a potential explanation why functional words are often freely omitted in many analytic languages.

## Acknowledgements

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## References

- Aikhenvald, Alexandra Y. 2000. *Classifiers: A typology of noun categorization devices*. Oxford: Oxford University Press.
- Bale, Alan, and Jessica Coon. 2014. Classifiers are for numerals, not for nouns. *Linguistic Inquiry* 45.
- Bale, Alan, Michael Gagnon, and Hrayr Khanjian. 2011. Cross-linguistic representations of numerals and number marking. *Proceedings of SALT 20* 582–598.
- Bale, Alan, and Hrayr Khanjian. 2009. Classifiers and number marking. In *Proceedings of SALT XVII*, ed. T. Friedman and S. Ito, 73–89. Ithaca, NY: Cornell University.
- Borer, Hagit. 2005. *In name only*. Oxford: Oxford University Press.
- Cheng, Lisa L.-S., and Rint Sybesma. 1998. Yi-wan tang, yi-ge tang: Classifiers and massifiers. *Tsing Hua Journal of Chinese Studies* .
- Cheng, Lisa L.-S., and Rint Sybesma. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30:509–542.
- Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6:339–405.
- Chierchia, Gennaro. 2010. Mass nouns, vagueness and semantic variation. *Synthese* 174:99–149.
- Corbett, Greville G. 2000. *Number*. Cambridge: Cambridge University Press.
- Deprez, Viviane. 2005. Morphological number, semantic number and bare nouns. *Lingua* 115:857–883.

- Doetjes, Jenny. 1997. *Quantifiers and selection: On the distribution of quantifying expressions in French, Dutch, and English*, volume 32 of *HIL Dissertations*. The Hague: Holland Institute of Generative Linguistics.
- Doetjes, Jenny. 2007. Adverbs and quantification. *Lingua* 117:685–720.
- Doetjes, Jenny. 2012. Count/mass distinctions across languages. In *Semantics: An International Handbook of Natural Language Meaning*, ed. Claudia Maienborn, Klaus von Stechow, and Paul Portner, volume 3, 2559–2580. De Gruyter Mouton.
- Greenberg, Joseph. 1977. Numeral classifiers and substantival number: Problems in the genesis of a linguistic type. In *Linguistics at the crossroads*, ed. Adam Makkai, Valerie Becker Makkai, and Luigi Heilmann, 276–300. Lake Bluff, Ill: Jupiter Press.
- Harbour, Daniel. 2011. Valence and atomic number. *Linguistic Inquiry* 42:561–594.
- Ionin, Tania. 2006. This is definitely specific: Specificity and definiteness in article systems. *Natural Language Semantics* 14:175–234.
- Ionin, Tania, and Ora Matushansky. 2006. The composition of complex cardinals. *Journal of Semantics* 23:315–360.
- Kramer, Ruth. 2015. *The morphosyntax of gender*. Oxford University Press.
- Kramer, Ruth. 2016. A split analysis of plurality: Number in Amharic. *Linguistic Inquiry* 47:527–559.
- Krifka, Manfred. 1995. Common nouns: A contrastive analysis of Chinese and English. In *The Generic Book*, ed. Gregory N. Carlson and Francis Jeffrey Pelletier, 393–411. Chicago, IL: The University of Chicago Press, Chicago.
- Krifka, Manfred. 2003. Bare NPs: Kind-referring, indefinites, both, or neither? In *Semantics and Linguistic Theory (SALT) 13*, ed. Robert B. Young and Yuping Zhou, 180–203.
- Link, G. 1983. The logical analysis of plural and mass nouns: A lattice theoretic approach. In *Meaning, use, and interpretation of language*, ed. R. Bäuerle, C. Schwarze, and A. von Stechow. Berlin: de Gruyter.
- Nomoto, Hiroki. 2013. Number in classifier languages. Doctoral Diss., University of Minnesota.
- Rothstein, Susan. 2011. Counting, measuring, and the semantics of classifiers. *The Baltic International Yearbook* 6:1–42.
- Rullman, Hotze, and Aili You. 2006. General number and the semantics and pragmatics of indefinite bare nouns in Mandarin Chinese. In *Where semantics meets pragmatics*, ed. Klaus von Stechow and Ken P. Turner, 175–196. Amsterdam: Elsevier.
- Sag, Yagmur. 2016. On the semantics of classifiers: A new perspective from an optional classifier language, Turkish. Rutgers University, lingbuzz/002999, May 2016.
- Schwartzschild, Roger. 1996. *Pluralities*. Dordrecht: Kluwer Academic Publishers.
- Simpson, A. 2005. Classifiers and DP structure in Southeast Asia. In *The Oxford Handbook of Comparative Syntax*, ed. Guglielmo Cinque and Richard Kayne, 806–838. Oxford University Press.
- Sudo, Yasutada. 2016. The semantic role of classifiers in Japanese. *The Baltic International Yearbook of Cognition, Logic and Communication* 11:1–15.
- Welmers, Wm. E. 1974. *African language structures*. Berkeley, CA: University of California Press.
- Wilhelm, Andrea. 2008. Bare nouns and number in Dëne Sùliné. *Natural Language Semantics* 16.
- Wiltschko, Martina. 2008. The syntax of non-inflectional plural marking. *Natural Language and Linguistic Theory* 26.