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PREFACE

Although the Austronesian Formal Linguistics Association (AFLA) has been holding annual meetings since 1994, until now it has had no consistent approach to the publication of its *Proceedings*. Papers from AFLA 2 and AFLA 14 were published as edited volumes; in other years the local organizers published the *Proceedings* in their Department's Working Papers series; in still other years no *Proceedings* was published. The 16th annual meeting of AFLA was held May 1-3, 2009, at the University of California, Santa Cruz. During the business meeting, the idea was floated that the *Proceedings* henceforth be published electronically, in a consistent format, at the AFLA website (<http://ling.uwo.ca/afla/>), which is generously hosted by the University of Western Ontario. The initial result is this volume, which has emerged very quickly indeed—less than six months after AFLA 16 was held. Our hope is that on-line publication of this and future volumes of the *Proceedings of AFLA* will enable research on the formal linguistics of Austronesian languages to reach as wide a readership as possible.

We want to thank UCSC's Linguistics Department and its Linguistics Research Center for hosting AFLA 16, the authors for submitting their papers so efficiently, and the University of Western Ontario for hosting the website at which this volume is posted. We also wish to acknowledge the precedent set by the *Proceedings of AFLA 12*, which was published on-line as *UCLA Working Papers in Linguistics* No. 12, and whose stylesheet heavily influenced the stylesheet we constructed for the *Proceedings of AFLA*.

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RADICAL UNDERSPECIFICATION, GENERAL NUMBER AND NOMINAL MAPPING IN INDONESIAN*

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This paper discusses the semantics of bare nominals, reduplication, and numeral modification in Indonesian. Evidence from ellipsis suggests that unmarked nouns in this language are associated with general number: they are underspecified for number (Greenberg 1972; Corbett 2000). Indonesian reduplication is a language-particular morphological operation to denote specifically plural. Numeral modification is an atom-accessing O(bject) U(nit) function (Krifka 1995) that applies to a set to give back the number of an entity involved in a plurality. Various properties of nouns in Indonesian receive a straightforward account in these terms, coupled with the notion of Expressive Economy, which blocks non-optimal/superfluous specification of the semantics of linguistic expressions (Chomsky 1995). Recent rebuttal of Chierchia's (1998a, b) Nominal Mapping Parameter by Chung (2000) based on Indonesian is also reviewed. It is shown that our present analysis predicts the particular cluster of the morphosyntactic characteristics of the nominal syntax in Indonesian observed by Chung as problematic for Chierchia's semantic typology. A new analysis of classifiers in Indonesian is also proposed, whereby contemporary Indonesian is in the transition from a classifier language like Chinese into a non-classifier language like Javanese and Dëne Sùliné. Following Wilhelm (2008), this transition is formalized as the word-level lexicalization of the OU function within the numeral system in contemporary Indonesian. Evidence from the pronominal use of numerals in Indonesian/Dëne Sùliné and the lack thereof in Chinese and Japanese is provided in favor of this analysis.

1. Introduction

The purpose of this paper is to explore the semantics of nominals in Indonesian. Firstly, I provide evidence from VP ellipsis that bare nouns in Indonesian are associated with general number (Corbett 2000; Carson 2000; Chung 2000). Second, I investigate the form and function of reduplication, classifiers, and numerals in this language and show how they interact with one another to derive properties of nominals observed. Finally, I propose that the generation of nominal superstructure above N follows expressive economy (cf. Chomsky 1995; Fox 2000; Reinhart 2006). According to this view, redundant/non-optimal specification of the semantics of nominals is always blocked.

* For comments, suggestions and questions, I thank Sandy Chung, Mark Donohue, Heidi Harley, Ed Keenan, Eri Kuriniawan, Hotze Rullmann, Martina Wiltschko, the audiences at AFLA 16 and the UCLA-UC Berkeley Joint Conference on Languages of Southeast Asia, and participants of my Spring 2009 syntax seminar at the University of British Columbia. Special thanks go to Dwi Hesti Yuliani and Enny Widijati for examples, judgments, and support.

2. General Number in Indonesian

As Chung (2000) observes, bare nouns in Indonesian denote either singularity or plurality, as shown in (1). Other languages with this property include Malay (Carson 2000), Chinese (Rullmann and Yu 2006), Javanese (Sato 2008), and Malagasy (Paul 2009).¹

- (1) Kuda sedang makan.
 horse Prog eat
 ‘One or more horses are eating.’

Evidence from parallelism constraints on ellipsis (Zwicky and Sadock 1975; Cruse 1986; Carson 2000; Rullmann and Yu 2006) suggests that unmarked nouns in Indonesian are underspecified for number rather than ambiguous between singular and plural readings. Consider examples (2-4).

- (2) Budi mendapat lampu merah dan Ali juga. (ambiguous)
 Budi receive lamp red and Ali also
 → Budi received a red lamp and Ali received a red lamp.
 → Budi received a warning and Ali received a warning.
 → * Budi received a red lamp and Ali received a warning.
 → * Budi received a warning and Ali received a red lamp.
- (3) Budi melihat anak dan Ali juga. (underspecified for sex)
 Budi see child and Ali also
 → Budi saw a boy and Ali saw a boy.
 → Budi saw a girl and Ali saw a girl.
 → Budi saw a boy and Ali saw a girl.
 → Budi saw a girl and Ali saw a boy.
- (4) Budi mendapat kuda dan Ali juga. (underspecified for number)
 Budi receive horse and Ali also
 → Budi received one horse and Ali received one horse.
 → Budi received more than one horse and Ali received more than one horse.
 → Budi received one horse and Ali received more than one horse.
 → Budi received more than one horse and Ali received one horse.

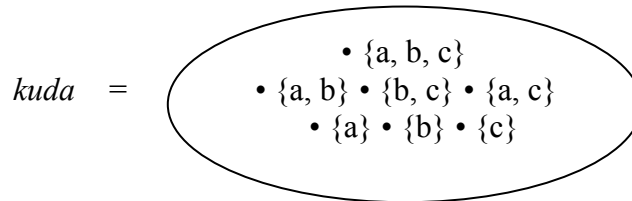
The phrase *lampu merah* is ambiguous between the literal reading (‘a red lamp’) and the figurative reading (‘a warning’). When we leave this phrase within the VP ellipsis context, as shown in (2), only two of the four logically possible interpretations are available. Now, compare this example with (3), which is minimally different from (2), in that *lampu merah* is replaced by *anak* ‘child’. In (3), all of the four possible interpretations are available. The availability of these

¹ Abbreviations used in the morpheme glosses in this paper include the following: Acc, accusative; Asp, aspect; Cl, classifier; Cop, copula; Distr, distributive/plural; 1sgS, first person singular subject; Gen, genitive; Neg, negation; O, object; Perf, perfective; Prog, progressive; Red, reduplication; Top, topic.

readings makes sense because *anak* ‘child’ is underspecified with respect to the sex of a child/children involved. (4) with the bare noun *kuda* ‘horse/horses’ patterns with (3), not with (4). This result, therefore, shows that bare nouns in Indonesian are underspecified for number.

Following the above argument, I conclude that bare nouns in Indonesian are associated with general number. They are “non-committal as to number” (Corbett 2000: 10; see also Greenberg 1972) or constitute the “neutralization of the singular-plural distinction” (Chierchia 1998a: 347). Represented in a different way, the denotation of an unmarked noun in Indonesian is a complete semi-lattice generated by a set of atomic entities, as shown in (5) (Link 1983; Rullmann and Yu 2006; Chierchia 1998a: 352).

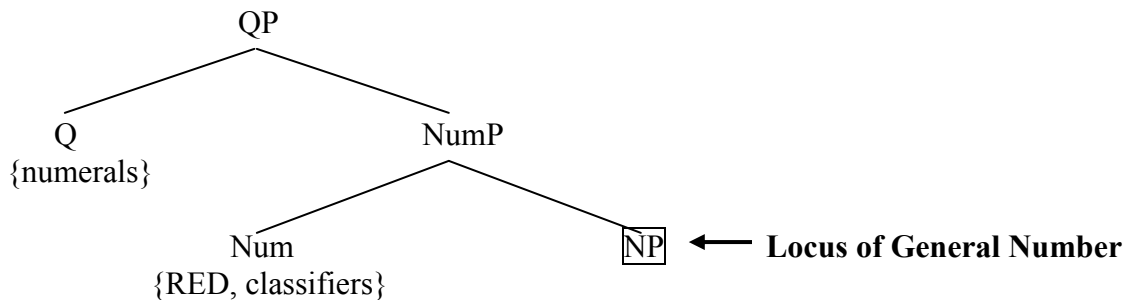
(5)



3. The Internal Syntax and Semantics of Nominals in Indonesian

In this section, I consider the syntax and semantics of nominals in Indonesian with special attention to the function of reduplication, classifiers, and numeral modifiers. The nominal superstructure above NP I argue for is given in (6).

(6)



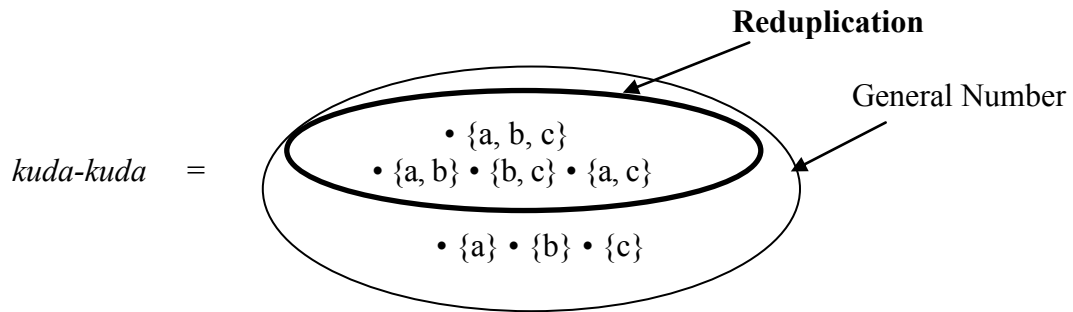
It is possible that contemporary Indonesian has the DP on top of QP in (6), given MacDonald’s (1976: 85) observation that *itu* ‘that’ and the enclitic pronoun *-nya* ‘his, her, its, their’, when combined with nouns, tend to make them definite, thereby “coming to fulfill a function very much like that of the definite article ‘the’ in English”, but I leave this possibility open in this paper.

The Num(ber) head in Indonesian hosts either the reduplicative null morpheme RED or a classifier. MacDonald (1976) and Sneddon (1996) observe that reduplication in Indonesian expresses specifically plural. This observation is formalized in (7) and represented in (8).

(7) The Semantics of Reduplication in Indonesian

For any $A \subseteq U$, $PL(A) = *A - At$.

(8)



This analysis of reduplication captures nicely Dyen’s (1864: 7a-10) analysis about nominal reduplication, as cited by Chung (2000:167-168). Dyen’s analysis is replicated below:

The Indonesian speaker makes the choice according to whether the collection of plural objects is to be regarded as (1) constituting a more or less uniform mass or as (2) made up of a number of discrete objects. In the first case, the undouble[d] word is used and in the second, the double[d] word is used. Thus *kursi* means ‘a chair, a collection of undifferentiated chairs’ and *kursikursi* means ‘a collection of different chairs’.

According to our proposed analysis, what Dyen perceives as “constituting a more or less uniform mass” corresponds to our notion of general number whereas what he perceives as “made up of a number of discrete objects” corresponds to the result of our characterization of reduplication.

Let us now turn to classifiers in Indonesian. Contemporary Indonesian has three classifiers in common use: *orang*, *ekor*, and *buah*. However, classifiers are optional after *satu* ‘one’, *dua* ‘two’, and numerals higher than 2 (Dardjowidjojo 1978; MacDonald 1976; Wolff et al. 1992; Sneddon 1996; Dalrymple and Mofu 2009), as illustrated in (9a-c).

- (9)
- | | | | |
|----|------------------|---------|---------|
| a. | Tiga | (orang) | siswa |
| | three | Cl | student |
| | ‘three students’ | | |
| b. | Tiga | (ekor) | kuda |
| | three | Cl | horse |
| | ‘three horses’ | | |
| c. | Tiga | (buah) | meja |
| | three | Cl | table |
| | ‘three tables’ | | |

Evidence from complementary distribution between classifiers and plural markers suggests that classifiers are in the Num head position as the RED morpheme (T’sou 1976; Cheng and Sybesma 1999). T’sou (1976: 1216), as cited in Borer (2005: 92, 93), makes the following observation.

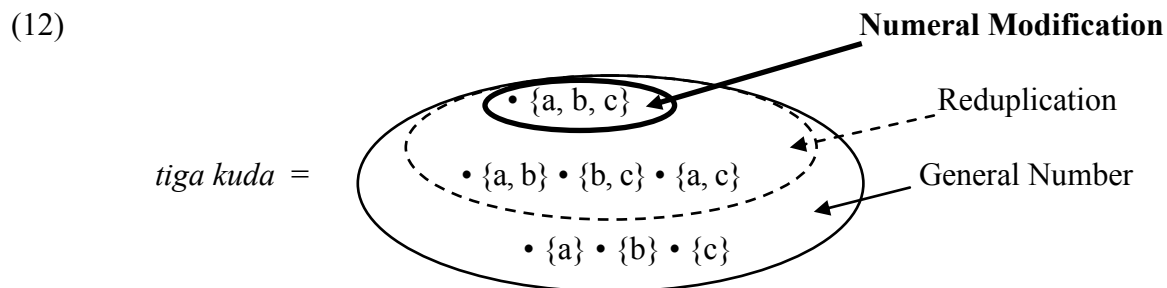
The study of nominal classifier systems suggests an important hypothesis that the use of nominal classifiers and the use of plural morpheme is in complementary distribution. More concretely, it suggests that either a) a natural language has either nominal classifiers or plural morphemes, or b) if a natural language has both kinds of morphemes, then their use is in complementary distribution.

Indonesian conforms with T'sou's observation. Example (10) shows that an overt classifier is incompatible with reduplication, suggesting that they compete for the same Num head position.

- (10) (*orang) siswa-siswa
 Cl student-Red
 'students'

Turning now to numeral modification, following Krifka (1995) and Wilhelm (2008), I assume that a numeral denotes an atom-accessing function O(bject) U(nit) that, applied to a set, returns a number of atomic entities in a plurality. Formally, the semantics of a numeral is defined as in (11). For illustration, the denotation of *tiga kuda* 'three horses' is shown in (12). This states that *tiga* denotes a function from a set P (of atoms and sums) onto that subset of P containing the sums of three object units/atoms.

- (11) The Semantics of Numerals in Indonesian
 $[[tiga]] = \lambda P \lambda x [P(x) \ \& \ OU(x) = 3]$



4. Indonesian within Chierchia's (1998a, b) Nominal Mapping Parameter

In this section, we review Chierchia's (1998a, b) theory of nominal denotation across languages and Chung's (2000) arguments that Indonesian counterexamples this theory.

Chierchia (1998a, b) proposes that languages differ as to what they let their bare nouns denote. Specifically, bare nouns and their projections are mapped onto kinds (type $\langle e \rangle$), properties (type $\langle e, t \rangle$), or both. The first type of language ([+arg, -pred]), in which bare nouns denote kinds (Carlson 1977), allows bare arguments, lacks singular-plural distinction, and develops a generalized classifier system. Chierchia mentions Japanese and Chinese as languages of this type. The second type of language ([-arg, +pred]), in which bare nouns denote predicates, does not allow bare nominal arguments; instead, a D is always required for a nominal to be saturated, whether it is overt or covert. French and Italian belong to this type. The last type of language ([+arg, +pred]), such as English and German, constitutes the intersection of the [+arg, -pred] and [-arg, +pred] languages, where bare nouns may be mapped either to kinds (for mass and bare plurals) or properties (for count nouns).

Chung (2000) develops arguments that Indonesian does not fit into any of the three language types under Chierchia's semantic typology. Let us review her core arguments here. First,

examples (13a, b) (see also (2-4)) show that Indonesian is a bare nominal argument language, just like Chinese and Japanese, meaning that Indonesian is not a [-arg, +pred] language.

- (13) a. Trotski pernah meneriakkan bahwa partai tidak bisah bersalah.
 Trotski once yell.out that party not can wrong
 ‘Trotski once asserted loudly that the party could not be wrong.’
 (MacDonald (1976: 102), as cited in Chung (2000: 160))
- b. Saya pinjam mobil dari kantor.
 I borrow car from office
 ‘I borrowed a car from the office.’
 (Wolff et al. (1992: 715), as cited in Chung (2000: 159))

Second, as we saw earlier, Indonesian has reduplication to denote specifically plural. This is illustrated here in (14a, b).

- (14) a. Kuda sedan makan. (= (1a))
 horse Prog eat
 ‘One or more horses are eating.’
- b. Kuda-kuda sedang makan.
 horse-Red Prog eat
 ‘*One horse/more than one horse are eating.’

The availability of bare nominal arguments and the existence of reduplication as means of pluralization shows that Indonesian is not a [+arg, -pred] language.

Finally, (15a, b) and (16a-c) show that Indonesian is also not a [+arg, +pred] language.

- (15) a. Ali didn’t see a spot on the floor.
 → Ali did not see any spot on the floor. (narrow scope)
 → There was a spot Ali failed to see on the floor. (wide scope)
- b. Ali tidak jadi membeli buku.
 Ali Neg finish buy book
 → Ali didn’t buy any book. (narrow scope)
 → * There was a book that Ali failed to buy. (wide scope)
- (16) a. Dogs bark.
 → More than one dog are barking. (plural reading)
 → It is a general property of dogs that they bark. (generic reading)
- b. Anjing-anjing menggonggong.
 dog-Red bark
 → More than one dog are barking. (plural reading)
 → * It is a general property of dogs that they bark. (generic reading)

- | | | | |
|----|--------|--|-------------------|
| c. | Anjing | menggongong. | |
| | dog | bark | |
| | → | More than one dog are barking. | (plural reading) |
| | → * | It is a general property of dogs that they bark. | (generic reading) |

As is well known, an indefinite NP in English can take either narrow or wide scope with respect to negation, as shown in (15a). This is not the case with a bare noun such as *buku* ‘book’ under its indefinite interpretation, as shown in (15b), which only allows for the narrow scope reading. This discrepancy would remain unexplained if Indonesian were a [+arg, +pred] language. A similar argument is made on the basis of the contrast between (16a) and (16b) concerning generic statements. As shown in (16a), the English plural marker *-s* allows both plural and generic readings. Again, the Indonesian example in (16b) shows that Indonesian is different in that reduplication only allows for the plural reading. Notice that the generic reading is expressed by the bare counterpart *anjing* ‘dog’, as shown in (16c).

The above results, therefore, cast doubt on the rigid one-to-one mapping between the denotation and morphosyntactic profile of a bare noun as required by Chierchia’s semantic theory. In the next section, I show how various properties of nominals in Indonesian, including those observed in this section, can be derived from the assumptions made in sections 2-3.

5. How General Number + Expressive Economy Give us Indonesian?

Following Borer (2005), Kim (2006) and Wiltschko (2008), I propose that bare nouns are universally associated with general number precisely because they are bare/unmodified in syntax. This “bareness”, then, gives us the conceptually motivated default mass/”stuff” orientation for Ns. I further argue, following the spirit of Chomsky (1995), Fox (2000), and Reinhart (2006) (see also Law 1991, Bošković 1997 and Speas 1994), that the licensing of nominal superstructure above Ns is subject to expressive economy at the semantic interface. This analysis bans the syntax from taking any superfluous steps that are semantically vacuous.

5.1. Deriving the Properties of Nominals in Indonesian

Let us now consider how various properties of nouns in Indonesian can be derived under our proposed analysis. First of all, Indonesian is a bare nominal argument language (13a, b). This property directly falls out from our proposed characterization of bare nouns in this language in terms of general number, a way to leave the number specification underspecified. This association amounts to the neutralization of the singular vs. plural distinction/kind orientation, precisely a result that Chierchia attempts to capture by his Nominal Mapping Parameter.

Second, bare nouns in Indonesian necessarily take narrow scope with respect to negation (15b). This property is also a straightforward consequence of the kind orientation of bare nouns. Specifically, bare nouns each constitute a name for a particular kind. Thus, they are scopeless with respect to negation. In this regard, bare nouns show a parallel behavior with proper names, as shown in (17a-c).

- (17) a. I didn't see John. (John = obligatory narrow scope wrt negation)
 b. Neg [I saw John]. (without the scope-shifting operation)
 c. John_i [I didn't see *t_i*]. (with the scope-shifting operation)

Fox (2000) provides evidence that the scope-shifting operation/Quantifier Raising is blocked due to interface economy. Then, the obligatory narrow scope of a bare noun with respect to negation in Indonesian follows from its kind orientation and interpretation-dependent economy.

Third, reduplication in Indonesian cannot be used for generic statements (16b). This property can also be given a principled account under our economy-based approach. The kind-orientation of a bare noun is sufficiently suitable for generic statements, as shown in (16c). Thus, introduction of nominal superstructure is blocked once again by interface economy.

Our analysis may also shed light on an observation that has remained unanalyzed in the literature, namely, that numerals equal to or greater than two do not co-occur with reduplication in Indonesian (Dalrymple and Mofu 2009). This observation is illustrated in (18a, b). Carson (2000) points out that reduplication is ungrammatical in numeral modification in Malay as well.

- (18) a. Tiga siswa
 Three student
 'three student'
 b. * tiga siswa-siswa
 three student-Red
 'three students'

Our economy-based analysis suggests an answer to the ungrammaticality of (18b). Reduplication denotes plurality whereas *tiga* 'three' denotes plurality as well as a particular number. Thus, using a numeral modification is a more expressive option than reduplication.

5.2. Plurality across Languages

The observation that plural markers do not co-occur with numeral modification is not a quirk of Indonesian. It also holds for Chinese, Japanese, and Javanese, as shown in (19a-c).

- (19) a. * san-ge haizi-men
 three-Cl child-MEN (Chinese: Cheng and Sybesma 1999: 537)
 'three children'
 b. ?? san-nin-no gakuse-tati
 three-Cl-Gen student-TATI (Japanese: Kurafuji 1999: 80)
 'three students'
 c. * telung murid-murid
 three student-Red (Javanese)
 'three students'

Then, our economy-based analysis of (18b) has crosslinguistic support.

A potential problem with the present analysis comes from English. The problem is why *three students* is grammatical, but *three student* isn't, a pattern opposite to that exhibited by Indonesian. This problem, however, only arises under the commonplace assumption that *-s* is a plural morpheme. There are two arguments, due to Krifka (1989), that this morpheme does not denote specifically plural, as Indonesian reduplication does.² One argument concerns compulsory "plural" agreement with decimals. As shown in (20a-d), all decimals smaller than and even equal to 1.0 trigger what is commonly conceived of as plural agreement on the noun it quantifies.

- (20) a. 0.2 apples/*apple
 b. 0.1 apples/*apple
 c. 1.5 apples/*apple
 d. 1.0 apples/*apple (Borer 2005: 115)

The other argument concerns truth conditions in "plural" nouns. Statement (23) is true even in a situation where only one dog is removed. This would be mysterious if *-s* denoted semantically plural, which would require at least two dogs to be removed for the sentence to be true.

- (21) Any dogs will be removed.

6. Classifiers in Contemporary Indonesian vs. 19th-Century Malay

As illustrated in (9a-c), classifiers are optional after numerals in contemporary Indonesian. Poedjosoerdarmo (1982: 84) and Chung (2000: 162-164) observe that the optionality of overt classifiers is conceivably due to influence from Javanese, which does not have a classifier system. Citing Hopper's (1986) statistical results of the *Hikayat Abdullah*, an autobiography published in 1849, Chung (2000: 164) further observes that at an earlier stage of the language, overt classifiers were more frequent than they are today after *dua* 'two' and higher numerals. I take these results to indicate that contemporary Indonesian undergoes gradual transition from a classifier language to a non-classifier language.

Following the analysis of numerals in Dëne Sùliné proposed by Wilhelm (2008), I propose to analyze this transition as the word-level lexicalization of the OU function within the numeral system. The denotation of the numeral *tiga* 'three' in contemporary Indonesian is repeated here as (22). Compare this denotation with that of the same word in 19th Century Malay in (23).

- (22) The Semantics of Numerals in Indonesian (= 11a)
 $[[\text{tiga}]] = \lambda P \lambda x [P(x) \ \& \ \text{OU}(x) = 3]$
- (23) The Semantics of Numerals in 19th Century Malay
 $[[\text{tiga}]] = 3$
 $[[\text{buah}]] = \lambda n \lambda P \lambda x [P(x) \ \& \ \text{OU}(x) = n]$ where *n* is a natural number
 $[[\text{tiga buah}]] = \lambda P \lambda x [P(x) \ \& \ \text{OU}(x) = 3]$

² Thanks to Hotze Rullmann for directing my attention to decimal agreement and Heidi Harley for suggesting the argument based on truth conditions.

In (22), *tiga* denotes not only cardinality but also an atom-accessing OU function that, applied to a set, yields the number of object units in a plurality. In 19th Century Malay, *tiga* only denotes cardinality, as in (23), so classifiers are required as a separate set of lexical items to support the OU function. In other words, the optionality of classifiers in contemporary Indonesian consists in the enrichment of the numeral system so as to lexically include the OU function. Contemporary Indonesian has a built-in classifier system whereas 19th Century Malay doesn't.

Evidence from the pronominal use of numeral modification suggests that numerals in Indonesian indeed behave as those in non-classifier languages, not as those in classifier languages. The reasoning runs as follows. Numerals include an object unit in their denotation in built-in classifier languages. Thus, they should be able to stand alone pronominally. This postnominal use is impossible for numerals in classifier languages. This contrast is illustrated in (24-28).

(24) I bought two new blankets. One is black and one is red. (English; Wilhelm 2008: 58)

(25) Tth'idziné k'e ts'ééré nádághı́nı́gh. /ɬághe
yesterday blanket Distr-Perf-1sgS-buy O one
delzën-ú /ɬághe delk'os.
black-and one red

'Yesterday I bought blankets. One is black and one is red.'

(Dëne Sų́liné; Wilhelm 2008: 59)

(26) Aku tuku rung selimut anyar. Siji ireng lan siji abang.
I bought two blanket new One black and one red
'I bought two new blankets. One is black and one is red.' (Javanese)

(27) Wo mai-le liang-tiao xin tanzi. Yi-*(**tiao**)hei-de, yi-*(**tiao**) hong-de.
I buy-Asp two-CI new blanket one-CI black-DE one-CI red-DE
'I bought two new blankets. One is black and one is red.' (Chinese; Wilhelm 2008: 59)

(28) Watasi-wa huta-tu-no atarasii moohu-o katta. Ichi-*(**mai**)-wa
I-Top two-CI-Gen new blanket-Acc bought one-CI-Top
kuro-de, ichi-*(**mai**)-wa aka-da.
black-Cop one-CI-Top red-Cop
'I bought two new blankets. One is black and one is red.' (Japanese)

The examples in (24-26) show that numerals can stand alone in non-classifier languages such as English, Dëne Sų́liné, and Javanese. On the other hand, the examples in (27, 28) show that numerals cannot stand alone in classifier languages such as Chinese and Japanese. Now, our proposed analysis predicts that contemporary Indonesian should behave like English and Dëne Sų́liné, not like Chinese and Japanese. This prediction is borne out by example (29).

(29) Saya membeli dua selimut baru. Satu hitam dan satu merah.
I bought two blanket new One black and one red
'I bought two new blankets. One is black and one is red.' (Indonesian)

7. Conclusions

In this paper, I have explored the semantics of bare nominals, reduplication, and numeral expressions in Indonesian. Bare nouns are underspecified for number. Reduplication denotes specifically plural. Numerals denote not only cardinality but also an atom-accessing function. I have shown that various syntactic and semantic properties, including those Chung (2000) noted as arguments against Chierchia's (1998a, b) Nominal Mapping Parameter, are naturally accounted for in these terms, coupled with the independently motivated notion of Interface Economy, which blocks non-optimal/redundant specification of the semantics of linguistic objects. I have also presented an analysis of optional classifiers in contemporary Indonesian whereby the numeral system builds in the OU function which was expressed separately by a classifier in 19th Century Malay. This analysis receives support from the pronominal use of numerals in Indonesian, Dëne Sųliné, and Javanese and lack thereof in Chinese and Japanese.

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