Number and plural semantics: Empirical evidence from Marori

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This paper presents new empirical evidence from Marori (a Papuan language of Southern New Guinea) for the semantics of number in a complex number system. Marori has a basic three-way number system, singular/dual/plural. Marori is notable for showing distributed number exponence and constructed number strategies, in sharp contrast with familiar two-way, morphologically simpler number systems in languages such as English. Unlike in English, the reference of plurals in Marori in many contexts is to a group of three or more individuals. While Marori's number system is typologically quite different from English, it shows an intriguing similarity in that in certain contexts, plural/nonsingular forms allow an inclusive reading (i.e. reference to any number of individuals, including one). The paper also presents evidence that all number types, including constructed dual, can be used for generic reference. The paper concludes with remarks on the theoretical significance of our findings.

1. Introduction[1]

This paper presents first-hand evidence bearing on the semantics of number and plurality in the complex number system of Marori (highly endangered; ISO 639-3: mok; subgroup-level isolate, TNG/Papuan, 16 fluent speakers). The number system in Marori is quite different from that of well-studied Indo-European languages like English. Overall the system distinguishes 'singular', 'dual', and 'plural',[2] but these number categories are often morphosyntactically constructed, with individual markers on words often underspecified. Free pronouns express a singular vs. nonsingular distinction. Common nouns in Marori do not show number inflection, although a small set of nouns show number distinctions via suppletion. Such nouns are inherently singular (e.g. *parapur* 'girl', *moipur* 'boy') or nonsingular (e.g. *meninggon* 'children') and must appear with the appropriate agreement forms. Marori determiners also mark number within the noun phrase, distinguishing singular from non-singular number. Marori verbs encode nominal number via agreement marking, as well as pluractionality or verbal number; pluractional marking distinguishes S/O-oriented pluractionality from S/A-oriented pluractionality. Pluractionality interacts in interesting and complicated ways with nominal number.

Cross-linguistically, plural noun phrases generally require reference to more than one individual. However, in certain contexts a plural form can refer to any number of individuals, including a single individual. A plural reading allowing reference to one or more individuals is called an *inclusive plural reading*. In contrast, an *exclusive plural reading* requires reference to two, three, or more individuals, and excludes reference to a

[2] We use the term "singular" (abbreviated SG) for reference to one individual, "nonsingular" (NSG) for more than one individual, "dual" (DU) for two individuals, "nonplural" (NPL) for fewer than three individuals, and "plural" (PL) for three or more individuals.

single individual. [3] Inclusive and exclusive readings of plural noun phrases in English are illustrated in (1) (Farkas & de Swart 2010).

(1)   a.   *I saw children.*
             (Exclusive plural reading only: speaker saw <u>more than one child</u>; false if the speaker saw only one child)

        b.   *I didn't see children.*
             (Inclusive plural reading: speaker did not see <u>one or more children</u>)

        c.   *Did you see children?*
             (Inclusive plural reading: answer is <u>yes</u> if the addressee saw <u>even one child</u>)

        d.   *Everyone with children will receive a benefit.*
             (Inclusive plural reading: those <u>with even one child </u>will receive a benefit)

As seen in (1), the same plural noun phrase *children* appears in all four sentences, but its reference is not the same. In a positive context like (1)a, the plural *children* refers to more than one child (henceforth, '>1'). Sentence (1)a is false if the speaker saw only one child: this is the exclusive reading of the plural. In (1)b-d, however, *children* has an inclusive reading; that is its reference also includes **single** individuals. Sentence (1)c, for instance, can have a positive answer (*yes*) even if the addressee saw only a single child.

Now consider example (2) from Marori, which resembles (1)b in involving a negative context. Here, the nonsingular noun *meninggon* 'children' appears as the object of the verb 'see', and the verb stem *yafo-* 'see' is the nonsingular object form (that is, the nonsingularity of the object is specified both by the object noun and by the verb). As in the English example (2)b, *meninggon* 'children' has an inclusive plural reading, as the translation of (2) shows.

(2)   *Na   maar   fis   meninggon   yafo-bon*
        1SG   NEG   yesterday   child.NSG   see.NSG.O-1PST

        'I didn't see children yesterday.' (Speaker did not see <u>even one child</u>)

Inclusive readings are available for Marori plurals and nonsingulars in contexts similar to (1)c,d as well, as we will see. [4]

 In the following, we explore the readings that are available for nominal phrases with different number values in Marori. As example (2) shows, while the number system in Marori is quite different from the number system in English, there is an intriguing similarity between Marori and English: nonsingular/plural forms in Marori exhibit inclusive and exclusive plural readings in the same contexts as in English. This is particularly significant in light of the fact that number marking in Marori can be constructed by means of distributed exponents in syntax. For example, we will see that there is no dedicated morphology for the expression of dual number for the second and third person; rather, dual is encoded by combining a nonsingular nominal argument with a verb showing nonplural agreement marking. Importantly, constructed number marking has the same effect as lexical (i.e. non-constructed) number, supporting semantic/

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[3] The terms 'inclusive' and 'exclusive' used here to distinguish plural readings have nothing do with the first person inclusive/exclusive pronouns found in many Austronesian languages.

[4] Many of the examples we present come from the Marori corpus, a range of (interlinearised) texts collected as part of the Southern-New Guinea Project (http://chl.anu.edu.au/linguistics/projects/sng_ project/). Information about the source text is given at the end of the examples. Examples without such annotation were elicited.

pragmatic analyses as opposed to morphosyntactic analyses of exclusive/inclusive plural readings.

This striking similarity between the distribution of inclusive and exclusive plural readings in Marori and English, despite radical differences in morphological expression of number and number categories, raises questions concerning the nature of plural semantics and the grammar of number in a wider typological and theoretical context. Here we do not provide an in-depth theoretical discussion of these important issues; instead, our aim is to outline the basic facts regarding the semantics of plurality in Marori, and to establish the similarities and differences in the semantics of number between Marori and more well-studied European languages like English. We will examine the range of readings available for nonsingular noun phrases in Marori in a range of contexts. We also make a brief exploration of genericity, showing that generic readings are available for all number values, including dual. We hope that our paper will form a solid foundation for further exploration of genericity, the availability of inclusive/exclusive readings for nonsingular noun phrases, and the crosslinguistic semantics of number.

The paper is structured as follows. An overview of recent research on number and plurality is given in section 2, followed by a brief outline of grammatical relations and marking in Marori in section 3. In section 4, we present the semantics of number and plural meanings in Marori, starting with the default plural reading (4.1), inclusive/exclusive plural readings (4.2-4) and generic reference (4.4). We conclude with a summary and remarks on the theoretical significance and implications of our findings for linguistic theory.

2. Background: Research on plurality

Descriptions of number systems in reference grammars typically focus on the morphosyntax of number marking and the place of the language in the wider cross-linguistic context of number systems (singular, dual, paucal, plural, etc.). Cross-linguistic variation in the expression of nominal number is indeed remarkable (Corbett 2000). Plural marking may be grammatically obligatory, as with English nominals (pronouns/nouns/determiners) and verbs, or optionally expressed, for example by reduplication as in Indonesian (Dalrymple & Mofu 2012). It may be expressed only on nouns, as in Chinese (Li & Thompson 1981), or only on verbs or demonstratives (via agreement/indexing) as in Oceanic languages such as South Efate (Thieberger 2006). And some languages, like Pirahã, lack plural marking altogether (Everett 1986, 2005).

Complex number systems are often encountered in the languages of the Pacific. Larike (Laidig & Laidig 1990), for example, distinguishes not only singular vs. plural but also dual (two individuals) and trial (three individuals). In Oceanic languages, complex four- or five-way number systems are reported, e.g. Sakao (Crowley 2002) and Manam (Lichtenberk 1983), with a 4-way distinction (singular/dual/paucal/plural), and Lihir and Tangga (Corbett 2000:29) with a 5-way distinction (singular/dual/trial/ paucal/plural).

A common assumption regarding the semantics of the plural, simplifying somewhat (in particular, ignoring mass nouns), is that the singular refers to one individual, whereas the plural refers to more than one individual ('>1') (Link 1983, Chierchia 1998). This accounts for the impossibility of *one children*, and for the exclusive plural reading of example (1)a. However, in languages with more complex systems of plurality such as Marori, which has a singular/dual/plural system in which dual forms are obligatorily used (when available) for reference to two entities, plural means 'more than two' ('>2') in contexts similar to 1(a). Furthermore, we have seen that plural forms in English can have

inclusive plural readings ('one or more') in certain contexts ((1)b,c,d). Patterns of inclusive and exclusive plurality, as in (1), have been the subject of intense scrutiny in theoretical studies of English and other well-studied languages with a two-way singular/plural number system (Sauerland et al. 2005, Zweig 2008, Farkas & de Swart 2010; Grimm 2010). In contrast, there has been very little work on inclusive/exclusive readings for plural noun phrases in languages with number systems that differ from English (indeed, Dalrymple & Mofu 2012, 2013 provide what are, to our knowledge, the only other studies of inclusive/exclusive plural readings in languages with a number system other than the Standard European singular/plural system). The availability of inclusive/exclusive plural readings in similar contexts in typologically quite different languages such as English (1) and Marori (2) is surely not a coincidence. We hope that our work will illustrate the substantial descriptive and theoretical challenge posed by these patterns, and will lead to further insights into the nature of plural meaning and, more broadly, the semantics-syntax interface.

3. Grammatical relations and verbal morphology in Marori

Marori, like many other Papuan languages, is a non-configurational, verb-final language. Its clausal word order is shown in (3). Subject and object NPs typically come before the verb, without a fixed order. The verbal predicative complex typically consists of a lexical predicate (X), not necessarily a verb, which is immediately followed by a (light or auxiliary) verb (V). The verb bears tense, aspect and mood (TAM) agreement morphology. Certain non-auxiliary verbs of high frequency such as 'run', 'walk', and 'sit' are directly affixed with TAM morphology.

(3)   NP*   X   V

Marori marks heads as well as dependents. In general, an agentive argument (i.e. transitive A(ctor)) receives suffix verbal agreement, whereas a patientive argument (O(bject)) receives prefix verbal agreement. The internal morphological makeup of the verb is quite complex, showing not only nominal argument number but also pluractionality (verbal number). The verbal template is given in Figure 1. As shown, S/O agreement is encoded prefixally, whereas S/A agreement is encoded as a suffix.[5] The circles indicate that number information is distributed across different exponents in an overlapping space.
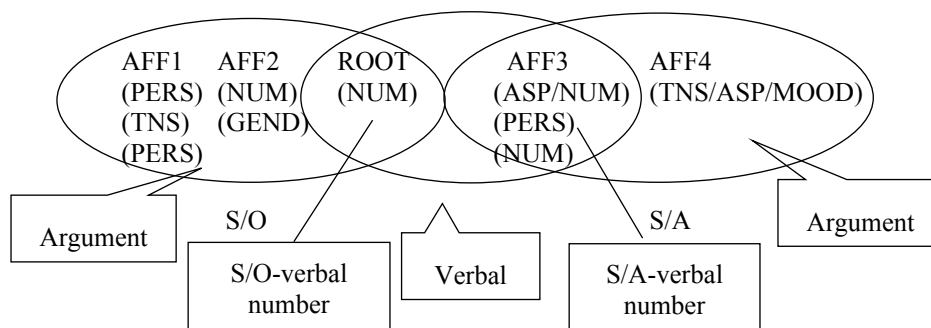
Figure 1. Verbal template in Marori (Arka 2011)

Arguments of semantically intransitive predicates receive different morphosyntactic realisations in Marori, depending on their semantic role. Patientive arguments (e.g. the

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[5] The abbreviations S, A, and O follow their traditional use in typological linguistics: S (intransitive subject), A (transitive subject), and O (transitive object). However, it should be noted that the patientive S can be analysed as a transitive O when the predicate is semantically an affector, e.g. 'X/S (become) sick' = 'sickness affects X/P'.

subject of 'be sick' and 'be cold') receive the undergoer *=i* clitic and prefix verbal agreement in the same way as the transitive O argument.[6] Consider (4), where *na* '1SG' is marked by *=i* and receives the verbal agreement prefix *i-* in both sentences. Sentence (a) is semantically intransitive (i.e. '(be) cold') but it is realized like a surface transitive, with the patientive (O) NP argument flagged with *=i*. This is an instance of the impersonal transitive structure in Marori (Arka 2015) where the verbal morphology shows transitive inflection carrying (non-referential) A features, in this case *-f* '3NPL'. [7]

(4)   Patientive argument NPs

a. *na=**i**   pwatar i-nggo-f*
    1SG=U cold   1SG-AUX-3NPL.NRPST

    'I suffered from being cold.'

b. *Pa   na=**i**   Thomas ter=**i**-mo-∅*
    soon   1SG=U Thomas hit=1SG-AUX-3NPL.FUT

    'Thomas will hit me soon.'

The agentive intransitive subject (S), like the transitive subject (A), receives verbal suffix agreement and cannot be marked by *=i*.

(5)   Agentive argument NPs:

a. *na (*=i) fis   kund-ra-mon*
    1SG   yesterday run-PL-1NPL.DUR.NRPST

    'I was running yesterday.'

b. *na   tefye-ben   menjun   awo=i   paya-ke*
    1SG   see.3SG.M.O.-1NPL.NRPST   small.SG kangaroo=U forest-LOC

    'I saw a small kangaroo in the forest.'

In a ditransitive structure, *=i* typically marks the recipient (R) object NP as in (6)a. Both objects can be marked with *=i* as in (6)b-c, however.

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[6] Note that the enclitic *=i* is not an object marker but a semantic role (undergoer/patientive) marker, hence the glossing with 'U' rather than with 'O'. Thus, the intransitive S (see the example in footnote 7) as well as the transitive subject (A) can receive the clitic *=i* marking as in the following example:

a. na=i   John=i   nggerngger   yu-nggo-bon
    1SG=U John=U   forget   1SG-AUX-1NPL.NRPST

    'I forgot John.'

[7] A reviewer suggests that in structures of the type shown in (4)a the predicate 'cold' serves as the A argument agreeing with the suffix *–f* '3NPL.NRPST'. While this is a plausible analysis for a subset of examples of this construction, we adopt an impersonal active transitive analysis where the A suffix does not actually agree with any (thematic) argument, including the predicate 'cold'. The suffix appears for grammatical reasons to encode TAM (in this case NRPST). Evidence for the A suffix not indexing the predicate ('cold') in this type of structure comes from its constrast with the middle structure where the verb can be inflected with the suffix *–du* referring to the sole argument NP '1SG':

a'. *na=i   pwatar   i-inggo-du*
    1SG=U   cold   1SG-AUX-1SG.PRES

    'I was/am suffering from cold.'

(6)   Ditransitives

    a. *Na   Albert=**i**   njime-ben   bosik sokodu.*
        1SG   Albert=U   3SG.M.O.give-1NPL.NRPST pig   one

        'I gave Albert a pig.'

    b. *Pafe sorweri=**i** John njim-im   poyo=**i**   fis*
        DEF basket=U   John 3SG.M.O.give-DUR.NRPST coconut=U   yesterday

        'John filled the basket (with) coconuts.'

    c. *Na fis   njomo-bon   Maria=**i** bosik=**i** sokodu*
        1SG yesterday 3SG.O.F.give-1NPL.NRPST Maria=U   pig=U   one

        'I already gave Maria a pig yesterday.'

Intransitive motion verbs pattern like agentive verbs; i.e. their arguments show suffix agreement, irrespective of whether they are patientive or agentive:

(7)   *na   fis   kwi uyow   soron-du*
        1SG   yesterday tree top   fall-1S.PRES
        'I fell out of the tree yesterday.'

4. Number marking in Marori

Overall, the Marori number system encodes a three-way distinction (singular, dual and plural). The distribution of number marking and agreement follows the animacy hierarchy (cf. Corbett 2000:90ff): the singular-dual-plural division is relevant only in the top segments of the hierarchy (first and second bound pronominals); the plural vs. nonplural or singular vs. nonsingular distinction is relevant for the third person (bound/free) pronominals. Common nouns have no number marking, though certain nouns (typically human nouns) such as *parapur* 'girl.SG' /*moipur* 'boy.SG' and *meninggon* 'children.NSG' are lexically specified for singular or nonsingular number. Derived adjectival nominals are inflected showing a SG vs. NSG distinction. Determiners also mark number within the noun phrase when they are present, distinguishing singular from nonsingular number.

Adjectival nominals typically of the individual-level type functioning as predicates require number inflection, either morphologically marked by –*on* (realised as -(*w)en/-(w)on*) 'SG' and –*nde* 'NSG' as in the examples in (8), or lexically suppletive showing a NPL/PL or SG/NSG distinction, e.g. *monjun* 'small.NPL' vs. *menindum* 'small.PL' as in (9).

(8)   a. *John   tanamba ndar-on   te*
           John   now   thin-NOML.SG   BE.3NPL.PRES
           'John is thin now.' (Lit. 'John is a thin one now')

      b. *Emnde   usindu tanamba nder-nde   te-re.*
           3NSG   all   now   thin-NOML.NSG   BE-3PL.PRES
           'They are all thin now.' (Lit. 'They are all thin ones now.')

(9)   a. *John   monjun   te.*
           John   small.SG   BE.3NPL.PRES
           'John is small.' (Lit. 'John is a small one')

b. *John   Maria   fi   menindum te.*
John   Maria   and   small.NSG   BE.3NPL.PRES

'John and Maria are small.' (Lit. 'John and Maria are small ones')

c. *Emnde usindu menindum   te-re.*
3PL   all   small.NSG   BE-3NPL.PRES

'They are all small.' (Lit. 'They (>2) are all small ones.')

Singular (SG) and nonsingular (NSG, >1) determiners are shown in (10); the noun *ramon* 'woman' is invariant, and the determiners *efi* 'DET.SG' and *emnde* 'DET.NSG' mark number in the noun phrase:

(10)   a. *efi   ramon   sokodu*
DET.**SG** woman   one

'The (one) woman'

b. *emnde   ramon   yanadu*
DET.NSG   woman two

'The two women'

c. *emnde   ramon   usindu*
DET.NSG   woman all

'All of the women'

Tables 1-3 show the pronominal system in Marori, including the free pronouns and their corresponding bound affixes. As Table 1 shows, free pronouns and S/O prefix forms distinguish singular from nonsingular (SG/NSG). For simplicity, only the O prefix set for the remote/near PAST tense is shown in Table 1. The corresponding S/A suffixes are quite complex, as shown in Tables 2-3.[8] These suffixes are portmanteau forms showing person, number, tense, aspect, and mood. They are of two classes, depending on the aspectual properties they encode in their past tenses: completive (or telic) and durative. Note that there is often syncretism between the singular and dual forms, giving rise to a nonplural (singular or dual) vs. plural contrast.

Table 1. Free pronouns and S/O prefixes in Marori

		1	2	3
Free Pronoun:	SG	*na*	*ka*	*efi*
	NSG	*nie*	*kie*	*emnde*
PAST S/O Pref:	SG	*i-*	*k-*	*Ø-*
	NSG	*iar-*	*kar-*	*Ø-*

Table 2. Class 1 argument suffixes in Marori

	(1a)			(1b)			(1c)		
	IRR/FUT			NRPST (Completive)			RMPST (Completive)		
	1	2	3	1	2	3	1	2	3
SG	*-ru*	*-Ø*	*-Ø*	*-ben*	*-f*	*-f*	*-fori*	*-fi*	*-fi*
DU	*-ren*	*n--Ø*	*-Ø*	*-ben*	*n- -f*	*-f*	*-fori*	*n- -fi*	*-fi*
PL	*-men*	*n-(ri)m*	*-(ri)m*	*-freben*	*n- -(fre)f*	*(fre)f*	*-mbrofori*	*-mbrofi*	*mbrofi*

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[8] Some of the second person forms in Tables 2 and 3 are circumfixes with initial *n-*. For simplicity, in the verbal template shown in Figure 1 these are treated as suffixes, and the position of *n-* is not captured.

Table 3. Class 2 argument suffixes in Marori

	(2a) REAL/MacroPRES (Completive/extended)			(2b) NRPST (Durative)			(2c) RMPST (Durative)		
	1	2	3	1	2	3	1	2	3
SG	*-du*	*-Ø*	*-Ø*	*-men*	*-m*	*-m*	*-maf*	*-maf*	*-maf*
DU	*-den*	*n-Ø*	*-Ø*	*-men*	*n- -m*	*-m*	*-maf*	*n- -maf*	*-maf*
PL	*-men*	*n--Ø*	*-Ø*	*-ben*	*n- -b/-m*	*-b/-im*	*-baf*	*n- -baf*	*-baf*

While arguments with plural marking in positive contexts encode exclusive plural ('>2') meaning, it is not the case that nominal arguments referring to more than 2 entities must receive unambiguously plural marking. Reference involving >2 may be simply expressed by nonsingulars when there is no plural form available, as is the case with the free pronouns (which have SG vs. NSG forms); furthermore, some verb forms may have no overt plural affix, e.g. the third person in (macro)present tense. The same is true for reference to a group of 2, which may also be simply expressed by nonsingular forms. In these cases, the precise number interpretation of '>2' or '2' is determined by context, or alternatively by overt quantification such as *usindu* 'all, a lot' or *yanadu* 'two'.

Reference to a single individual is likewise not necessarily expressed by a singular form, as this meaning is compatible with expression by a nonplural marker. Indeed, nonplural marking is the only option available for certain agreement categories, e.g. subject agreement for 2/3 person. Thus, in the following quotation from a frog story, the speaker is talking about a single person, but the nonplural copular verb *kuyamaf* is used. This nonplural form is the only choice because it just happens that the paradigm of the positional copular verb in the remote past paradigm for the third person in Marori only has a NPL vs. PL distinction.

(11) *maipur efi   naw   Thomas   kuya-maf*
      boy   that   name Thomas   BE.2/3NPL -2/3NPL.RMPST

      'The boy's name was Thomas.' (nonplural subject)
      (FrogStory_Paskalis.003: 00:00:38.210-00:00:41.540)

Likewise, in the following example, the same NPL verb *kuyamaf* is used:

(12) *Maria   kuya-maf   korya   kofrow*
      Maria   BE.2/3NPL -2/3NPL.RMPST   food   eat.NF

      'Maria was sitting around while eating.' (nonplural subject)

Marori also marks pluractionality, or verbal number (Arka 2011); that is, verbal morphology indicating the number of occurences of events (one/once vs. multiple events/times). Verbal number marking often indicates participant plurality as well as event plurality (Corbett 2000), though this is not always the case. In Marori, this depends on the lexical aspectual classes of the predicate.

Verbal number in Marori is of two types, encoded in different ways: the S/A and S/O types. The two may interact in a complex way showing syncretism.

The first S/A type is marked by *-ro* (or its allomorphs *-re/-ri/-ra*). The same morphology is also used as the progressive/iterative marker. This suffix is therefore not a subject agreement marker because it can appear with a singular subject as shown in (13)a. In this

example, the pluractional-*ri* expresses an iterative meaning, in constast to (13)b where it is absent.

(13) a. *ke   na   kaŋgari umo-ndu,   mbe Thomas fek ŋgu-ri-m*
          when 1SG here   come-1SG.R exist Thomas nod AUX-PL-2/3NRPST.DUR
          'When I came here, Thomas was nodding.'

      b. *ke   na   kaŋgari umo-ndu,   Thomas fek **ŋgu-f***
          when 1SG here   come-1SG.R   Thomas nod AUX-3NRPST
          'When I came here, Thomas nodded (once).'

However, for certain verb classes, S/A pluractional marking requires plurality of the transitive/intransitive subject; hence, we can treat S/A pluractional marking in these classes as marking the S/A argument as plural. One subclass marking the number of the S/A argument to be plural is the class of stative intransitive predicates like 'be rotten', 'be strong', and 'be sick'. Consider the following examples:

(14) a. *awe   pamnde   mew-de   te-re*
          fish   DET.NSG   rotten-NSG   BE.PRES-3.PL.NFUT
          'The fish (two or more) are rotten.'

      b. *awe pafi   mew-en   te*
          fish   DET.SG rotten-SG   BE.3.NPL.PRES
          'That fish is rotten.'

      c. **awe   pafi   mew-en   te-re*
          fish   DET.SG   rotten-SG   BE.PRES-3.PL.NFUT

(15) a. *na   tanamba   tge   tombo-du*
          1SG   now   strong   1.BE.NPL-1SG.PRES
          'I am now strong.'

      b. *nie   (yanadu) tanamba tge   tombo-den*
          1NSG   two   now   strong   1.BE.NPL-1DU.PRES
          'We two are now strong.'

      c. *nie   (usindu) tanamba tge   te-re-men*
          1NSG   all   now   strong   BE-PL-1PL.PRES
          'We are all now strong.'

Two-place psych predicates such as 'hate' also mark the number of the A argument:

(16) a. *Na   John=i   kamaen   pnde-ben*
          1SG   John=U   hate   3SG.M.AUX-1NPL.NRPST
          'I hated John.'

      b. *Nie   yanadu   John=i   kamaen   pnde-ben*
          1NSG   two   John=U   hate   3SG.M.AUX-1NPL.NRPST
          'We two hated John.'

      c. *Nie   usindu   John=i   kamaen   pnde-fre-ben*
          1NSG   all   John=U   hate   3SG.M.AUX-PL-1.NRPST
          'We all hated John.'

Another subclass marking the number of the S/A participant is the class of transitive predicates expressing a punctual two-participant event like 'hit', where multiple events

of hitting done by multiple agents must be expressed by S/A verbal number. Thus, in the sentences in (17), the object is singular, and –re/-ro marking cannot be used to express repetitive events done by a singular A (for which the plural S/O verb is used; see (19)a-b below.

(17)   a.   *Emnde   usindu   Maria=i   tor=mbo-ro-f*
            3NSG   all   Maria=U   hit.SG=3SG.F.AUX-PL-2/3NPL.NRPST

            'They all hit Maria.' (plural subject, singular F object)

       b.   *Emnde   usindu   John=i   ter=mbe-re-f*
            3NSG   all   John=U   hit.SG=3SG.M.AUX-PL-2/3NPL.NRPST

            'They all hit John.' (plural subject, singular M object)

The second type, S/O verbal number, is distinctive in that it is realised by suppletive verbal root alternates as exemplified in (18). The S/O-verbal number shows alternate forms expressing the number of events due to marking of the number of transitive objects or the intransitive subjects. Note that reference to two events does not have a consistent pattern across lexical items: two events are classified as NPL by the verb *kuye* 'sit', but as NSG by the verb *kei* 'bring'.

(18)   Suppletive roots expressing S/O-verbal number
       nde   'bring.SG.O'   vs.   *kei*   'bring.NSG.O'
       tr   'hit.NPL.O'   vs.   *ksw*   'hit.PL.O',
       kunonjo   'go.NPL'   vs.   *kurfenj*   'go.PL',
       anep   'big.SG'   vs.   *kofe*   'big.NSG'
       kuye   'sit.NPL'   vs.   *mingg*   'sit.PL'

As in the S/A type, the S/O type may or may not require plurality of the participant. The S/O plural verbal number of the verb 'hit', for example, can be used with a singular object to encode iterativity as shown in example (19)a. There is a syncretism here where the same form *kaswa=ma-m* is also used to express a plural object (19)b. As noted, a non-plural hitting requires a NPL root. The verb should also appear with the non-durative/completive suffix –*f*.

(19)   a.   *Thomas   Maria=i   kaswa=ma-m*
            Thomas   Maria=U   hit.PL=AUX-2/3NPL.NRPST.DUR

            'Thomas hit Maria (several/many times)', or
            'Thomas was hitting Maria.' (nonplural subject, S/O pluractionality)

       b.   *Thomas   emnde   usindu=i   kaswa=ma-m*
            Thomas   3NSG   all=U   hit.PL-3-AUX-2/3NPL.NRPST.DUR

            'Thomas hit/was hitting them all.'
            (nonplural subject, plural object, S/O pluractionality)

       c.   *Thomas   Maria=i   tor=mo-f (sokodu/yanadu   ngge)*
            Thomas   Maria=U   hit.NPL=3SG.F.AUX-2/3NPL.NRPST   one/two times

            'Thomas hit Maria (once or twice).' (nonplural subject, singular F object)

However, the S/O verbal number of the class of verbs expressing inherently durative events such as 'sit' requires plural S/O participants. We can therefore treat S/O pluractional marking on durative predicates as marking the S/O argument as plural. This is exemplified in (20) with the verb 'sit' (*kuye* 'sit.NPL' vs. *mingg* 'sit.PL'). As noted, repetitive or habitual sitting by a single participant (20)c cannot be expressed by the plural root *mingg-*.

(20) a. *John   ndu   fis   kuye-m   keke*
      John INT   yesterday sit.NPL-3NPL.NRPST.DUR   here
      'Only John sat here yesterday.' (nonplural subject)

    b. *Usin purfam=ndu   fis   keke   mingg-ri-m*
      all   person=INT   yesterday here   sit.PL-3PL-2/3NRPST.DUR
      'All persons sat here yesterday.' (plural subject)

    c. *John   nggie   keke   kuye-∅   /   *mingg-ri*
      John often   here   sit.NPL-3NPL.PRES   sit.PL-3PL.PRES
      "John often sits here.' (nonplural subject required)s

S/O and S/A verbal number can co-occur. This is exemplified by the intransitive predicate 'sit' in (20)b above where the S/O root *mingg* appears with the S/A suffix *–ri*.

The transitive verb 'bring' also shows that S/O and S/A verbal number can co-occur as exemplified in (22).

(21) Verbal number *bring*

			S/O-vn:	
			SG.O	NSG.O
		NPL:	*nde*	*kei*
S/A-vn:				
		PL:	*nde-re*	*kei-re*

The verb also further highlights that the predicate 'bring' is a durative type of verb where the S/O and S/A verbal number reflects the participant/nominal number. The singular object, for example, requires a singular verbal root (22)a, and the plural object requires a plural root (22)b.

(22) a. *nie   usindu   sajer-sajer   sokodu   poyo=i*
      1NSG   all   day-REDUP   one   coconut=U

      nde-re-men   pambe
      bring.SG.O-PL-1PL.PRES   there
      'We all (three or more), each of us, every day bring one coconut there.'
      (plural subject, singular object)

    b. *Emnde   yanadu   poyo=i   kei-f   nggambe*
      3NSG   two   coconut=U   bring.NSG.O-2/3NRPST   there
      'They (2) brought coconuts there.' (nonsingular subject modified by *yanadu* 'two', nonsingular object)

The plural A subject requires the S/A pluractional *–re* as shown in (23)a. The habitual/repetitive 'bring' event with a singular A subject must appear without the pluractional suffix (23)a.

(23) a. *nie   usindu   sajer-sajer   kei-re-men*
      1NPL   all   day-REDUP   bring.NSG.O-PL-1PL.PRES

      nggunjendumba   poyo=i   pambe
      several   coconut=U   there
      'We all bring several coconuts there every day.'

b. *Johni sajer-sajer poyo   sokodu=i ndi   pambe.*
    John   day-REDUP coconut one=U   bring.SG.O-3NPL.PRES there
    'John brings one coconut there every day.'

In sum, nominal number is indicated in several ways in Marori:

- through lexically inherently singular (e.g. *parapur* 'girl', *moipur* 'boy') or nonsingular (e.g. *meninggon* 'children') nouns;

- through singular or nonsingular determiner marking;

- through S/A pluractional marking on (psychological) stative predicates and predicates expressing punctual events;

- through S/O agreement marking on verbs and auxiliaries;

- through S/O pluractional marking on durative predicates.

Having outlined the basic properties of grammatical relations and marking in Marori, we can now proceed to the semantics of plurality in Marori.

5. Plural meanings in Marori

In this section we present data illustrating exclusive and inclusive plural readings in Marori. Human and non-human nouns show the same pattern. We begin with plural meaning in positive contexts in (5.1), followed by plural readings under negation (5.2) and in questions (5.3) and conditionals (5.4).

5.1. Plural meaning in positive contexts

In positive contexts, Marori plurals receive exclusive ('>2') readings involving at least three individuals. This is the kind of plural reading that native speakers report when they are specifically asked how many participants or entities are involved in events expressed by verbs with S/O plural agreement marking, like the plural auxiliary verb *panda-fra-f* '3.AUX-PL-2/3NPL.NRPST' and durative verbs with S/O pluractional marking such as *mingg-ri* 'sit.PL-PL', either out of context or in contexts such as the one in (24) (from a corpus of naturally-occurring texts). In (24), the nonsingular determiner *kemnde* also appears, marking the subject noun phrase as nonsingular ('>1'); this marking is compatible with the plural S/O marking on the durative verbal predicate *minggri* 'sit.PL' and the auxiliary verb.[9] Arguments with plural marking in positive contexts do not refer to one or two individuals, but only to groups composed of more than two individuals.

(24) *aha kemde   mesnan mingg-ri   nggi woyomb-ro.*
      PART DET.**NSG** mother sit.**PL**-3PL.PRES sago wrap-PL

      'Here are the mothers (>2) wrapping sago.'

      Awe   nggalamo kamin panda-fra -f.
      fish   sago.mix   create 3.AUX-PL-2/3NPL.NRPST

      '(They) have made a mixed fish and sago.'
      (BukaSasiPaskalis)1092011_.086: 00:05:01.100-00:05:06.290)

Note that the sentence above cannot mean 'a mother repeatedly sitting and wrapping sago.' A nonsingular reading ('mothers') is imposed by the NSG determiner *kemnde*. Even in the absence of such a NSG determiner, a durational predicate like *miggri* 'sit' cannot

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[9] We ignore the plural marking on the verb *woyomb* 'wrap', which references *nggi* 'sago'.

convey a pluractional/repetitive reading with a single S/O participant, as shown in example (13).

5.2. Plural readings under negation

As with the English example in (1b), a negative context in Marori gives rise to allows an inclusive plural reading. In the following sentences, where the verbs are both marked by the (S/A) plural –*re* (*imbiref* `bite'), the inclusive plural reading is possible in a negative context (25)a, but not in a positive context (25)b. That is, the plural form *imbiref* 'bite' in (25)a can be used even when no single (or two, or more) snakes bit John (i.e. inclusive plural reading). In contrast, the positive context in (25)b allows only an exclusive plural reading (i.e. the agent *kaf* 'snake' refers to a collection of more than two snakes).

(25)　a.　*Maar tanamba kaf　John=i imbi-re-f*
　　　　　NEG　　just.now　snake John=U　3SG.M.bite-PL-2/3PL.NRPST

　　　　　'No snakes bit John just now.'
　　　　　(inclusive: Not even one snake (or two snakes) bit John.)

　　　b.　*John=i　kaf　imbi-re-f　　　　　　paya-ke　　fis*
　　　　　John=U　snake 3SG.M.bite-PL-2/3PL.NRPST　forest -LOC　yesterday

　　　　　'John was bitten by snakes (>2) in the forest yesterday.'
　　　　　(The exact number of snakes is unknown, but more than two.)

An inclusive plural reading is also found in negative contexts with the plural verbal root *serin* 'come.PL'. The default reading of this intransitive verb *serin* is that it refers to plural events of coming with plural participants.[10] This is exemplifed in (26), from a corpus of natural text in Marori:

(26)　*aa　　namik　　　sour　kengge serin　　sa　　koku　namon sour -ku*
　　　　PART　ADDRS.FORM house from　　come.3PL PART　here　1POSS　house-LOC

　　　　'You all from your houses come to mine.'
　　　　(MarkusStory.004: 00:00:11.783-00:00:16.905)

When negated as in (27)a, the plural reading can be inclusive. Thus, sentence (27)a conveys that no (single, two, or more than two) policemen came.

(27)　*Maar　koku　namon　　sour-ku　　　serin　　　　　polisi fis*
　　　　not　　there　1SG.POSS　house-POSS　come.3PL.NRPST　police yesterday

　　　　'There were no policemen coming to my house yesterday.'

Nonsingular (NSG) forms, which mean 'more than one' in most contexts, can also have an inclusive reading under negation. This is illustrated in (28)a. The sentence shows NSG agreement between the verb *yofo-* 'NSG.see' and its object *meninggon* 'children.NSG'. However, this sentence has an inclusive reading, and is acceptable when no single child was seen. Hence, (28)b is an acceptable continuation of (28)a.

(28)　a.　*Na　maar　fis　　　meninggon　　yofo-bon.*
　　　　　1SG　NEG　　yesterday children.**NSG**　3**NSG**.see-1NPL.NRPST

　　　　　'I didn't see children yesterday.'

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[10] The nonplural counterpart of 'come' is *umon*.

b. *Mbya   kyer   kuyem*
empty place   BE.3NPL.NRPST
'The place was empty (i.e., not even a single child).'

5.3. Plural readings in questions

Plurals in questions can also have an inclusive reading. For example, the question in (29)a exhibits PL agreement with the subject *kaf* 'snake(s)'. A felicitous positive response involving either one or two snakes is given in (29)b. That is, a positive answer to a question with a plural-marked subject is acceptable even when only one or two snakes bit the addressee.

(29)   a.   Question:
Pak Wayan,   mba   ka=i   kaf   k-imbro-ro-f?
Mr. Wayan   exist 2SG=U   snake   2SG-bite-PL-2/3NRPST
'Mr. Wayan, were there snakes biting you?'

b.   Answer:
Yo, (na=i)   sokodu /   yanadu   (kaf)   y-ambra-f
yes 1SG=U   one   two   snake   1SG-bite-2/3NPL.NRPST
'Yes, one snake / two snakes bit me.'

Likewise, the plural verb *serin* in (30)a below can have an inclusive reading. A positive answer using a nonplural verb *umon* is acceptable, as in (30)b; the use of the nonplural verb in the positive context in (21)b requires reference to one or two policemen.

(30)   a.   Question:
Mba   kenggari   polisi   serin?
Q   towards(.here)   police   come.PL.3PL.NRPST
'Did policemen come?'

b.   Answer:
Yo, tamba   polisi   umon
yes PERF   police   come.NPL.3NRPST
'Yes, a policeman/two policemen came.'

5.4. Plural reading in conditionals

A plural argument in the antecedent of a conditional structure also allows an inclusive reading. For example, given the statement in (31)a with the NSG object 'children', the statement in (31)b with singular object 'child' follows. That is, the person will be given money even when s/he brings a single child.

(31)   a.   *M=di   tina   kenggari   mninggon=i   kei-n*
EXIST=FUT   whoever   here   children.NSG=U   3NSG.bring-3NPL.DEIC

pa=na   par   njime-ru
FUT=1SG money   3SG.M.give-1SG.FUT
'Whoever brings children, I will give him money.'

b.   *Sokodu maipur nde-n,   pa=na   paar*
one   boy   SG.M.bring-3NPL.DEIC   FUT=1SG   money

njeme-ru
1SG.FUT
'(He) brings a boy, and I will give him money.'

Likewise, the plural object of the plural verb 'hitting' in (32)a has an inclusive meaning. That is, (32)b follows from (32)a, where only a single child was hit.

(32) a. *Pafi guru   nggie   mninggon=i   kaswa=ma,*
          that teacher often   children.NSG=U hit.PL =AUX.3NPL.FUT

          pa   polisi   tambra
          soon police   3.call.3PL.FUT

          '(If) the teachers often hit children, they will be summoned by the police.'

      b. *John sokodu moipur=i   keswe=mim,*
          John one   child=U   3SG.M.hit.PL=AUX.3NRPST.DUR

          pa   polisi   tambra   eme
          soon   police   3.call.3PL.FUT   DEF

          'John has hit a boy and the police will soon arrest him.'

5.5. Generic reference

Generic sentences with characterizing predicates involve predication of a typical property of individuals of a particular kind. In Marori, surprisingly, characterizing predicates can be formed with the constructed dual, in addition to singular and plural. The different possiblities of number categories used in characterizing predicates are exemplified in (33). These sentences all have generic reference to the tail feather of the bird of paradise, without any clear semantic difference.

(33) a. *Yag   ninam=ndu njimbu   kri-wen   te*   (sg)
          bird.of.paradise POSS=INT   tail.feather long-NOML.SG BE.3NPL.PRES

          'The tail feather of a bird of paradise is long.'

      b. *Yag   ninam=ndu njimbu kri-nde   te*   (dual)
          bird.of.paradise POSS=INT   tail   long-NOML.NSG   BE.3NPL.PRES

          'The tail feathers of a bird of paradise are long.'

      c. *Yag   ninam=ndu   njimbu kri-nde   te-re*   (plural)
          bird.of.paradise POSS=INT   tail   long-NOML.NSG   BE-3PL.PRES

          'The tail feathers of a bird of paradise are long.'

Of particular interest is the pattern in sentence (b) where the constructed dual is used. The dual is formed by combining the NSG predicative adjectival noun marked by *-nde* and the inflected NPL copular (*te*) (cf. example (9)b). The subject noun itself (*njimbu*) is, as most other common nouns in Marori, not inflected for number.

6. Concluding remarks

In this final section, we first highlight the contribution of our research and then provide pointers for future work. Our research findings (summarised in Table 4) provide fresh empirical evidence from an underdocumented language, Marori, which is typologically quite different from well-documented Indo-European languages like English. However, there is a surprising similarity between Marori and English in one important respect: an inclusive plural meaning is available for Marori nonsingulars and plurals precisely in contexts in which inclusive plurality is found in English, such as negation and questions.

Table 4. Number categories and their semantic properties in Marori

Number coding	Positive (default)	Inclusive reading	Generic
SG	1	-	yes
NSG	>1	Yes	yes
NPL	1 or 2	-	yes
PL	>2	Yes	yes

Table 4 highlights the differences and similarities between Marori and English. The Marori plural is different from the English plural in that in many contexts, it refers to a sum of three or more. The Marori nonsingular and plural, however, are like the English plural in that they can have either an exclusive or an inclusive plural reading, depending on the context. All number types, including dual[11] (cf. example (33)b), can have a generic reading in Marori.

The empirical findings reported in this paper raise interesting issues for future research on number markedness, number meaning and the morphosyntax of number. Of particular interest are issues in the larger theoretical context regarding the division of labour between morphology and syntax in number expressions. This in turns relates to the theory of grammatical relations and agreement in Marori, because number is one of the most important elements in the grammar of this language, with agreement at the heart of coding sytems with morphological, syntactic and semantic relevance. The question is how precisely morphological number (marking) contributes to the syntax and semantics of number. As clearly seen throughout the paper, the coding of number in Marori is quite different from that in English. In particular, Marori makes use of extensive distributed exponence and underspecification (e.g. NSG and NPL morphemes). The number coding labels listed in the leftmost column in Table 4 mark morphological number. That is, they are themselves not always exactly equivalent to the semantic number category in Marori. For example, the category of dual is not listed in the table. It can be constructed out of NSG and NPL.

The availability of an inclusive plural reading for plurals in certain contexts in Marori deserves further exploration both in this language and in other languages with similarly complex number systems. The question of the precise conditions under which such a reading is possible is a matter of future research. The role of contextual pragmatics must also be explored, as discussed in Farkas and de Swart (2010), Grimm (2010), and related work.

Finally, on the basis of our findings here (and also in related work, including Arka & Dalrymple 2013), there are good reasons to maintain the traditional separation of morphology, syntax and semantics; distinct types of number should be properly differentiated (morphological, syntactic, and semantic number) (Wechsler & Zlatic 2003, Corbett 2006, Corbett 2012, Kibort 2010). We believe that a satisfactory account of the intricacies of the grammar and semantics of plurality will ultimately require a sophisticated theory of number within a larger grammatical framework that captures the empirical patterns described in this paper and elsewhere. The analysis will benefit from a firmer empirical basis with data from languages with more complex number systems (see,

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[11] See Arka (2011) for a discussion of the constructed dual in Marori and also constructed marking strategies for other number categories in other languages.

for example, Dalrymple & Mofu 2012, 2013). We hope that we have made a good empirical contribution in this respect.

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