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Semantics of number in Biak

Mary Dalrymple
Centre for Linguistics and Philology
University of Oxford

Suriel Mofu
Faculty of Letters
Universitas Negeri Papua, Indonesia

Abstract

Much work has been done on the semantics of number in languages with a two-way singular vs. nonsingular number system, but much less work exists on the fine-grained semantics of number in languages with more complex number systems. We present data on Biak, an Austronesian language with a four-way distinction in the number system (singular/dual/paucal/plural). We show that, as in languages with simpler number systems such as English and French, Biak plurals exhibit inclusive plural readings in certain contexts, referring to any number of individuals including one. In other contexts, Biak plurals must refer to at least four individuals. We also show that the subjects of Biak dual and paucal verbs must be specific, precluding the possibility of inclusive plural readings for duals and paucals. We conclude with a brief look at the expression of various kinds of generic statements in Biak.

Keywords: Biak, number, plurality, inclusive/exclusive plurals

1 Introduction

Recent research on the semantics of number has focused particular attention on so-called **weak** (Sauerland et al. 2005) or **inclusive plural** (Farkas & de Swart 2010) readings, where the reference of a nonsingular noun phrase includes single individuals. An English example is *I didn't see children*, which, despite the use of the plural noun *children*, means that no children (not even one) were seen (Krifka 1989, Sauerland et al. 2005, Zweig 2009, Farkas & de Swart 2010). The availability of these readings is claimed to provide insight into the semantics of plural marking, and in fact it has been claimed that inclusive plurality (referring to any number of individuals, including one) is the basic meaning of the plural, with non-inclusive meanings (referring to two or more individuals) derived by some independent semantic or pragmatic effect. Much of this work has concentrated on languages like English and French, with an obligatory two-way singular/nonsingular contrast. We believe that important insights into the semantics of number can be gained by an examination of languages with different, more complex systems. In this paper, we examine Biak (Austronesian/South Halmahera-West New Guinea: van den Heuvel 2006, Mofu 2009), spoken in Indonesian West Papua by about 50,000–70,000 speakers.

Biak makes a three-way number distinction (singular/dual/plural) in the first and second person, and a four-way distinction (singular/dual/paucal/ plural) in the third person. Number is not marked on nouns, but robust and obligatory number distinctions are made in the verbal and determiner systems, including number marking for both the possessor and possessum in possessive determiners. Among researchers on number and gender, Biak is perhaps best known for violating Greenberg's Universal 45: "If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also" (Greenberg 1966). Biak third person pronouns make an animate/inanimate distinction only in the plural and not in the singular, dual, or paucal, as does the agreement paradigm for verbs and determiners.

We first provide a brief overview of previous work on the semantics of number and inclusive plural readings in languages like English. We then give a short synopsis of the morphosyntax of number marking in Biak. The main part of the paper is devoted to an exploration of the semantics of number in Biak. Among our findings are that (1) inclusive plural readings are not available with dual or paucal

number marking; (2) although plurals in contexts other than inclusive plural contexts generally refer to four or more individuals, in inclusive plural contexts an inclusive plural reading (any number of individuals) is available; (3) generic readings are available for plurals in Biak, but nonplurals can be arguments to kind-level predicates.

2 Inclusive vs exclusive plurals

Traditional analyses of the semantics of number in languages with a two-way singular/nonsingular distinction assume that the denotation of singulars ranges over individuals, while the denotation of nonsingulars ranges over sums, or collections consisting (in some sense) of more than one individual. This provides a straightforward account of the difference between (1a) and (1b):

1. a. I ate **an apple**. [singular: speaker ate one apple]
   b. I ate **apples**. [nonsingular: speaker ate more than one apple]

This illustrates an **exclusive** reading for the nonsingular:[1] the reference of nonsingular *apples* in (1b) excludes single apples, and includes only sums.

Krifka (1989) was among the first to notice that indefinite plurals in some contexts can have **weak** or **inclusive plural** readings, referring to groups of any cardinality (including individuals as well as sums). The answer to a question with a bare plural like *children* or *apples* is 'yes', even when the verifying situation involves only one child or half an apple:

2. a. Do you have children?
   — Yes, I have one child./*No, I have (only) one child.
   b. Did you eat apples today?
   — Yes, I ate half an apple./*No, I ate only half an apple.

(Krifka 1989: 85)

Inclusive plural readings are found in other contexts as well, including in the if-clause of a conditional and in the scope of negation. In the examples in (3), *horses* refers to one or more horses:

3. a. If you see **horses** in this meadow, you should call us. [inclusive: addressee is expected to call if one or more horses are seen]
   b. I did not see **horses** in this meadow. [inclusive: false if speaker saw one horse] (based on Farkas & de Swart 2010)

To facilitate comparison with other work, we will concentrate attention on indefinite plurals in negative contexts and questions, since these have been claimed to be typical contexts in which inclusive plural readings are found. Before examining readings available for different number values, we provide a brief overview of the morphosyntax of number in Biak. For in-depth discussion of the morphosyntax of number in Biak, see van den Heuvel (2006) and Mofu (2009).

3 Morphosyntax of number in Biak

3.1 Subject-verb agreement

Subject-verb agreement in Biak is obligatory. Mofu (2009: 27) provides the following paradigm of subject agreement affixes used with Type 1 consonantal stems; see Mofu (2009) for the paradigms for Type 2 consonantal stems and vowel stems:

	SG	DU	PAUCAL	PL
1INCL	-	ku-	-	ko-
1EXCL	ya-	nu-	-	(i)nko-
2	wa-	mu-	-	mko-
3	i-	su-	sko-	animate: si-/s- inanimate: na-/n-

In the first and second person, only three numbers are distinguished: singular, dual, and plural. In the third person, there is a four-way distinction: singular, dual, paucal, and plural. Notably, the third

[1] This use of the terms 'exclusive' and 'inclusive' is unrelated to their more common use to distinguish between two kinds of first person pronouns, inclusive (including the addressee) and exclusive (excluding the addressee).

person plural animate form differs from the third person inanimate form, but animacy does not play a distinguishing role for any other numbers. This violates Greenberg's Universal 45: "If there are any gender distinctions in the plural of the pronoun, there are some gender distinctions in the singular also" (Greenberg 1966, Steinhauer 1985, van den Heuvel 2006, Mofu 2009). Example (1) shows verbs conjugated according to the Type 1 consonant paradigm; subject pro-drop is allowed, and these verbs form complete sentences on their own.[2]

4. isapi
   i-sapi
   3SG-fall
   'He/she/it falls/fell.'
5. skombran
   sko-mbran
   3PAUCAL-walk
   'They walk/walked.'
6. yafrar
   ya-frar
   1SG-run
   'I run/ran.' (Mofu 2009: 23)

Coordinated subjects bear agreement appropriate for their semantic number: dual, paucal, or plural.

7. Snon oser ma bin oser suyan fas.
   Snon oser ma bin oser su-yan fas
   man one and woman one 3DU-eat rice
   'A man and a woman ate rice.'
8. Snon ma bin sra kame.
   snon ma bin s-ra kame
   man and woman 3PL.ANIM-go all
   'Men and women all go.' (Mofu 2009: 140)

3.2 Number within the noun phrase

Nouns in Biak are generally invariant,[3] with no productive or obligatory number marking. Reduplication is occasionally used to indicate nonsingularity. Number within the noun phrase is usually marked by determiners or demonstratives, though we will see that determinerless noun phrases with indeterminate number are also possible.

The determiner system of Biak is complex, with a large set of morphologically complex determiners expressing various combinations of person, number, gender, givenness, deixis, directionality, and specificity.[4] The following table shows the third person demonstratives and determiners (after Mofu 2009: 38):

[2] Glosses follow the Leipzig Glossing Rules (Bickel et al. 2009). We use the following additional abbreviations:

INDEF.NPI	indefinite negative polarity determiner	NUM.LINK	number linker	POSTDIST	postdistal
PRON	pronoun	REDUP	reduplication	VERB	verbalizing prefix

[3] Inalienable nouns, to be discussed in Section 3.3, are an exception: they are marked for the person and number of their possessor.

[4] Van den Heuvel (2006: Chapter 3) provides a very detailed analysis of Biak determiners and articles that differs in some respects from the analysis presented by Mofu (2009); we leave a full exploration of the differences between the two analyses for future work.

	proximal demonstrative	distal demonstrative	postdistal demonstrative	definite determiner
3SG	ine	iya	iwa	i/ya
3DU	suine	suiya	suiwa	sui/suya
3PAUCAL	skoine	skoiya	skoiwa	skoi/skoya
3PL.ANIM	sine	siya	siwa	si/sya
3PL.INANIM	na(i)ne	naiya	naiwa	na

As with verb agreement, animate and inanimate gender distinctions appear only in the plural. Our data will also include examples containing indefinite determiners (including singular *oso*) and a number-neutral negative polarity determiner *ono*.[5]

9. Rum ine iwawa.
   rum ine i-wawa
   house DEM.SG 3SG-shake
   'This house is shaking.'
10. Rum suine suwawa.
    rum su-ine su-wawa
    house DEM.DU 3DU-shake
    'These (two) houses are shaking.'
11. Rum skoine skowawa.
    rum sko-ine sko-wawa
    house DEM.PAUCAL 3PAUCAL-shake
    'These (several) houses are shaking.'
12. Rum nane nawawa.
    rum nane na-wawa
    house DEM.PL.INANIM 3PL.INANIM-shake
    'These (many) houses are shaking.'
13. Bin ine idoser kaku.
    bin ine i-doser kaku
    woman DEM.SG 3SG-beautiful very
    'This lady is very beautiful.'
14. Bin suine sudoser kaku.
    bin su-ine su-doser kaku
    woman DEM.DU 3DU-beautiful very
    'These (two) ladies are very beautiful.'
15. Bin skoine skodoser kaku.
    bin sko-ine sko-doser kaku
    woman DEM.PAUCAL 3PAUCAL-beautiful very
    'These (several) ladies are very beautiful.'
16. Bin sine sidoser kaku.
    bin sine si-doser kaku
    woman DEM.PL.ANIM 3PL.ANIM-beautiful very
    'These (many) ladies are very beautiful.'

3.3 Possession: Possessive determiners and inalienable nouns

There are two types of possessive constructions in Biak: alienable possessive constructions with a possessive determiner agreeing with both the possessor and possessum, and inalienable constructions where agreement with the possessor is marked on the possessed noun.

[5] Van den Heuvel (2006) categorizes *ono* as a nonsingular form, but we provide examples in the following of singular *ono*. It is unclear whether this reflects a difference between the Biak spoken by our consultants (including the second author) and the Wardo dialect described by van den Heuvel.

Possession of alienable nouns is marked by morphologically complex possessive pronouns; if the possessor is expressed, it precedes the head noun. The initial portion of the possessive determiner shows agreement with the possessor, and the final portion shows agreement with the possessum.

17. Yohanes rum byedya
    Yohanes rum b<y>e-dya
    John house <3SG>-POSS-DET.SG
    'John's house' (Mofu 2009: 98)
18. rum byedya
    rum b<y>e-dya
    house <3SG>-POSS-DET.SG
    'his house'
19. roma byesuya
    roma b<y>e-suya
    child <3SG>POSS-DET.DU
    'her (two) children'
20. rum sena
    rum s-be-na
    house 3PL.ANIM-POSS-DET.PL.INANIM
    'their houses'

For inalienable nouns, agreement with the possessor is marked on the head noun:

21. Yohanes bruri
    Yohanes bru-ri
    John head-POSS.3SG.DET.SG
    'John's head' (Mofu 2009: 98)
22. bruri
    bru-ri
    head-POSS.3SG.DET.SG
    'his head'
23. brumri
    bru-mri
    head-POSS.2SG.DET.SG
    'your head'

Many inalienable nouns have alienable counterparts; the noun *bukor* also means 'head', but is used in the alienable possession construction (examples 38-42).

3.4 Numeral modification

In numeral modification, the numeral follows the head noun. The number linker *ri* appears between the noun and the number, obligatorily with the numerals two to nine, and optionally with one and ten (Mofu 2009: 135-136).

24. roma ri fyak
    child NUM.LINK four
    'four children'
25. man ri samfur
    bird NUM.LINK ten
    'ten birds'
26. rum samfur seser eser
    house ten plus one
    'eleven houses'

3.5 Number marking in Biak and inclusive plural contexts

To summarise: Nominal number in Biak is not inflectionally marked on the noun, and reduplication to indicate plurality is possible but rare. Within the noun phrase, number is specified by determiners (including possessive determiners) and demonstratives. For subjects, nominal number is specified by

means of subject-verb agreement. For nonsubjects, if there is no determiner or demonstrative in the noun phrase, number is unmarked and indeterminate.

This raises some tricky issues for the examination of weak/inclusive plural readings in Biak, since the relevant data involve noun phrases for which number is clearly indicated. We do not expect to find inclusive readings with definite plural noun phrases, and so noun phrases with definite and demonstrative determiners are not relevant for our investigation of inclusive plurality in Biak. The situation with plural possessed noun phrases is difficult, and patterns are much less clear cross-linguistically: with respect to inclusive plural readings, such noun phrases pattern with indefinites in some respects, and are unlike indefinites in other respects.

This leaves subject-verb agreement as the best overt indicator of number for investigating inclusive plural readings; therefore, our examination of inclusive vs. exclusive plurality in Biak will focus on sentences in which the verb shows agreement with an indefinite subject. This requires us to consider examples that circumvent the strong cross-linguistic association between subjecthood and topicality, and the concomitant association between topicality and definiteness. Indeed, as we will see, the subject of a dual or paucal verb cannot be nonspecific, and this precludes the possibility of obtaining an inclusive reading for the subject of a dual or paucal verb in Biak.

4 Singular number

Bare nouns can appear as subjects of verbs with singular agreement. The indefinite singular determiner *oso* may optionally appear.

27. Ikak (oso) darek i.
    ikak (oso) d-arek i
    snake (one) 3SG-bite PRON.3SG
    'A snake bit him.'

Under negation, only a narrow scope reading for the indefinite subject is available:

28. Ikak (ono) darek i ba.
    ikak (ono) d-arek i ba
    snake (INDEF.NPI) 3SG-bite PRON.3SG NEG
    'A snake did not bite him.' [no snakes bit him]

Singular indefinites can also appear as the subject of a question:

29. Ikak darek i ke?
    ikak d-arek i ke
    snake 3SG-bite PRON.3SG Q
    'Did a snake bite him? '

A negative answer to (29) means that no snakes bit him, with the potential continuation "but a dog bit him", as shown in (30); a positive answer (31) means that a snake did bite him:

30. Oroba!
    No! [no snakes bit him]
    .. mboi makei beyarek i.
    mboi makei be-arek i
    but dog REL-bite PRON.3SG
    '...But (it was) a dog (which) bit him'
31. Imbo!
    Yes! [a snake bit him]

5 Plural number

Bare noun subjects can appear with plural agreement:

32. Plural subject:
    Ikak sarek i.
    ikak s-arek i
    snake 3PL.ANIM-bite PRON.3SG
    'Snakes bit him.' [plural: at least four snakes]

Paucal and not plural agreement must be used for groups of three, though paucal can also be used for a small number greater than three. This means that with plural agreement, the referent of the subject must include at least four individuals. An interesting exception to this generalization is illustrated in (34); for a restricted set of paired body parts, including breasts, either dual or plural agreement is acceptable (see van den Heuvel 2006: 236 for a discussion of similar examples).

33. sus byesuya
    sus b<y>e-su-ya
    breast <3SG>POSS-DET.DU-DEF
    'her (dual) breasts'
34. sus byesi
    sus b<y>e-si
    breast <3SG>POSS-DET.PL.ANIM
    'her (plural) breasts'

Paucal agreement is unacceptable, since it conveys that the individual has three breasts:

35. *sus byeskoya
    sus b<y>e-skoya
    breast <3SG>POSS-DET.PAUCAL.DEF
    ('her (three or more) breasts')

For these phrases, verb agreement must match the number of the determiner: dual agreement with the dual determiner, and plural agreement with the plural determiner.

36. Sus byesuya sumaker.
    sus b<y>e-suya su-maker
    breast <3SG>POSS-DET.DU.DEF 3DU-itchy
    'Her (dual) breasts are itchy (dual).'
37. Sus byesi simaker.
    sus b<y>e-si si-maker
    breast <3SG>POSS-DET.PL.ANIM 3PL.ANIM-itchy
    'Her (plural) breasts are itchy (plural).'

Unexpected plural marking is also found in possessive constructions. The noun *bukor* 'head' can appear in the alienable possession construction with a singular possessor, with (as expected) singular agreement with *bukor*:

38. bukor byedi
    bukor b<y>e-di
    head <3SG>POSS-DET.SG
    'his (singular) head (singular)'

With a dual or paucal possessor, plural agreement with *bukor* is also acceptable:

39. bukor subesuya
    bukor su-be-suya
    head 3DU-POSS-DET.DU
    'their (dual) heads (dual)'
40. bukor subena
    bukor su-be-na
    head 3DU-POSS-DET.PL.ANIM
    'their (dual) heads (plural)'
41. bukor skobena
    bukor sko-be-na
    head 3PAUCAL-POSS-DET.PL.ANIM
    'their (paucal) heads (plural)'

Paucal agreement with *bukor* is impossible with a dual possessor, since it would mean that two people had at least three heads:

42. *bukor subeskoya
    bukor su-be-skoya
    head 3DU-POSS-DET.PAUCAL
    ('their (two) heads (at least three)')

The existence of these cases is indirect confirmation of the plural as a 'default' category, not always tied to reference to four or more individuals.

Interestingly, the corresponding construction in the closely related language Dusner (Dalrymple & Mofu 2012) behaves differently. With a dual possessor, only singular agreement with *rvu* 'head' is possible:

43. rvu suveirya
    rvu su-ve-rya
    head 3DU-POSS-DET.3SG
    'their (dual) head (singular)' (Dusner)

Plural agreement is anomalous, producing the meaning that each of them has more than one head:

44. *rvu suvesia
    rvu su-ve-sya
    head 3DU-POSS-DET.3PL
    ('their (dual) heads (plural)': Dusner)

5.1 Negation

We now turn to an examination of inclusive plural contexts. As in languages like English, with simpler number systems, inclusive plural readings are in fact available in Biak for indefinite plural subjects. The negative polarity determiner *ono* is optional, and the noun can be reduplicated:

45. Ikak (ono) sarek i ba.
    ikak ono s-arek i ba
    snake INDEF.NPI 3PL.ANIM-bite PRON.3SG NEG
    'Snakes did not bite him.' [inclusive: no snakes bit him]
46. Ikak-ikak sarek i ba.
    ikak-ikak s-arek i ba
    snake-REDUP 3PL.ANIM-bite PRON.3SG NEG
    'Snakes did not bite him.' [inclusive: no snakes bit him]

5.2 Questions

Inclusive plural readings are also available for indefinite plural subjects of questions. The subject may be a bare or reduplicated noun, and the negative polarity determiner *ono* may optionally appear:

47. Ikak (ono) sarek i ke?
    ikak ono s-arek i ke
    snake INDEF.NPI 3PL.ANIM-bite PRON.3SG Q
    'Did snakes bite him? '
48. Ikak-ikak sarek i ke?
    ikak-ikak s-arek i ke
    snake-REDUP 3PL.ANIM-bite PRON.3SG Q
    'Did snakes bite him? '

A negative answer means that no snakes bit him, not even one; a positive answer means that one or more snakes bit him.

49. Oroba!
    No! [inclusive: no snakes bit him]
50. Imbo!
    Yes! [inclusive: one or more snakes bit him]

The Biak plural is, then, like plurals in languages with less complex number systems in having an inclusive plural reading in typical inclusive plural contexts. The dual and paucal behave quite differently, however, as we now show.

6 Dual and paucal number

Dual and paucal verbs are not acceptable with bare noun phrase subjects:

51. *Ikak suyarek i.
ikak su-arek i
snake 3DU-bite PRON.3SG
('(Two) snakes bit him.')
52. *Romawa farkor suyau i.
romawa farkor su-yau i
child student 3DU-attack PRON.3SG
('(Two) students attacked him.')
53. *Ikak skorarek i.
ikak sko-arek i
snake 3PAUCAL-bite PRON.3SG
('(Three/a few) snakes bit him.')
54. *Romawa farkor skoyau i.
romawa farkor sko-yau i
child student 3PAUCAL-attack PRON.3SG
('(Three/a few) students attacked him.')

Dual and paucal verbs can be used with numerals:

55. Ikak ri suru suyarek i.
ikak ri suru su-arek i
snake NUM.LINK two 3DU-bite PRON.3SG
'Two snakes bit him.'
56. Ikak ri kyor skorarek i.
ikak ri kyor sko-arek i
snake NUM.LINK three 3PAUCAL-bite PRON.3SG
'Three snakes bit him.'

These examples mean that out of some contextually given larger set of snakes, two (for the dual) or three (for the paucal) bit him: the subjects in (55-56) are indefinite but specific.

Dual or paucal agreement is also acceptable with definite subjects:

57. Ikak suya suyarek i.
ikak suya su-arek i
snake DEF.3DU 3DU-bite PRON.3SG
'The (two) snakes bit him.'
58. Roma farkor suya suyau i.
roma farkor suya su-yau i
child student DEF.3DU 3DU-attack PRON.3SG
'The (two) students attacked him.'
59. Ikak skoya skorarek i.
ikak skoya sko-arek i
snake DEF.3PAUCAL 3PAUCAL-bite PRON.3SG
'The (three/several) snakes bit him.'

These patterns are consistent with the hypothesis that dual and paucal subjects in Biak are required to be specific, and that bare noun phrases are necessarily interpreted as nonspecific and therefore indefinite. We interpret specificity in the sense of Enç (1991), in terms of a link to a previously established discourse referent (this is what Farkas (2006) calls 'partitive specificity'). On this view, all definites are specific, but indefinites may be either specific (connected in some way to an established discourse referent) or nonspecific.

This hypothesis accounts for the patterns of acceptability in (51-59). First, the bare noun subjects in (51-54) are nonspecific, and hence unsuitable as subjects of dual and paucal verbs in Biak.[6] Second, the subjects in example (55-56) do not appear with a definite determiner or demonstrative, but are

[6] Van den Heuvel (2006: Chapter 5) also discusses the important role of specificity in the interpretation of Biak noun phrases. However, his claims about the expression of specificity in Biak are quite different from ours. In particular, he proposes that the set of articles that we label as definite determiners in the table in Section 3.2 are actually specificity markers, and this leads him to a substantially different set of claims about specificity in Biak. We leave a detailed comparison of van den Heuvel's theory and ours for future work.

modified by a numeral: they are indefinite but specific, with a partitive interpretation, linked to an established discourse referent, a contextually relevant larger set of snakes. Third, the subjects in (57-59) are definite and hence specific, and are also acceptable as subjects of dual and paucal verbs.

6.1 Negation

Bare plural subjects of dual and paucal verbs with negation are unacceptable, just as for their non-negated counterparts:

60. *Ikak suyarek i ba.
ikak su-arek i ba
snake 3DU-bite PRON.3SG NEG
('(Two) snakes did not bite him.')

61. *Roma farkor suyau i ba.
roma farkor su-yau i ba
child student 3DU-attack PRON.3SG NEG
('(Two) students did not attack him.')

62. *Ikak skoyarek i ba.
ikak sko-arek i ba
snake 3PAUCAL-bite PRON.3SG NEG
('Three/A few snakes did not bite him.')

63. *Roma farkor skoyau i ba.
roma farkor sko-yau i ba
child student 3PAUCAL-attack PRON.3SG NEG
('Three/A few students did not attack him.')

Subjects with numeral modifiers are acceptable, but of course an inclusive plural reading is not available for these examples, since the cardinality of the subject is explicitly stated:

64. Ikak ri suru suyarek i ba.
ikak ri suru su-arek i ba
snake NUM.LINK two 3DU-bite PRON.3SG NEG
'Two snakes did not bite him.'

65. Ikak ri kyor skoyarek i ba.
ikak ri kyor sko-arek i ba
snake NUM.LINK three 3PAUCAL-bite PRON.3SG NEG
'Three snakes did not bite him.'

As in the case of the corresponding nonnegative sentences, these sentences mean that out of some contextually given larger set of snakes, two (for the dual) or three (for the paucal) did not bite him. Similar judgements hold for human indefinite subjects:

66. Roma farkor ri kyor skoyau i ba.
roma farkor ri kyor sko-yau i ba
child student NUM.LINK three 3PAUCAL-attack PRON.3SG NEG
'Three students did not attack him.'

Definite subjects are also acceptable in negative sentences:

67. Roma farkor suya suyau i ba.
roma farkor suya su-yau i ba
child student DEF.3DU 3DU-attack PRON.3SG NEG
'The (two) students did not attack him.'

68. Roma farkor skoya skoyau i ba.
roma farkor skoya sko-yau i ba
child student DEF.3PAUCAL 3PAUCAL-attack PRON.3SG NEG
'The (few) students did not attack him.'

6.2 Questions

Again as with the noninterrogative counterparts, nonspecific subjects of dual or paucal interrogatives are not allowed:

69. *Ikak (ono) suyarek i ke?
ikak ono su-arek i ke
snake INDEF.NPI 3DU-bite PRON.3SG Q
(‘Did (two) snakes bite him? ’)
70. *Ikak (ono) skoyarek i ke?
ikak ono sko-arek i ke
snake INDEF.NPI 3PAUCAL-bite PRON.3SG Q
‘Did (three or more) snakes bite him? ’

Specific indefinite subjects with an explicit numeral are acceptable:

71. Ikak ri suru suyarek i ke?
ikak ri suru su-arek i ke
snake NUM.LINK two 3DU-bite PRON.3SG Q
‘Did two snakes bite him? ’

A negative answer to (71), as in (72), is compatible with any situation not involving two snakes, while a positive answer means that exactly two snakes bit him:

72. Possible answers to (71):
Oroba!
No! (not two; possible if none, one, three or more snakes bit him) Imbo!
Yes! (two snakes bit him)

The same patterns are found with paucal interrogatives:

73. Ikak ri kyor skoyarek i ke?
ikak ri kyor sko-arek i ke
snake NUM.LINK three 3PAUCAL-attack PRON.3SG Q
‘Did three snakes bite him? ’
74. Possible answers to (73):
Oroba!
No! (any number other than three)
Imbo!
Yes! (Three snakes)

And for human subjects:

75. Roma ri kyor skosu
roma ri kyor sko-su
child NUM.LINK three 3PAUCAL-push
way ya be bande ke?
way ya be bande ke
canoe DET to landward Q
‘Did three children push the canoe landward?
76. Oroba! Mboi roma oser munda.
Oroba mboi roma oser munda
no but child one only
‘No, only one child (did).’

In summary, the subjects of dual or paucal verbs must be specific, which entails that they must be definite (and are then not expected to have inclusive plural readings) or modified by a numeral, in which case the cardinality of the referent is fixed and an inclusive plural reading is not available.

7 Genericity and kinds

Inclusive plural readings have been claimed to be linked to weak referentiality (Grimm 2010), which is related in its turn to genericity; here, we provide some brief remarks on number in generic sentences.

Generic sentences include sentences with **characterizing predicates** (Krifka et al. 1995, Cohen & Erteschik-Shir 2002, and references cited there), which state properties that generally hold of individuals of a particular kind. These are expressed via plural agreement with bare noun subjects; example (77) states a property that holds of wild pigs in general.

77. Randip sup sifnak rokakerna
randip sup si-fnak rokakerna
pig forest 3PL.ANIM-destroy plant
ro ras na kam
ro ras na kam
at day DEF.PL.INANIM all
'Wild pigs always destroy plants.'

The corresponding example with a definite determiner refers not generically, but to the habits of a particular group of wild pigs:

78. Randip sup sya sifnak
randip sup sya si-fnak
pig forest DEF.3PL.ANIM 3PL.ANIM-destroy
rokakerna ro ras na kam
rokakerna ro ras na kam
plant at day DEF.PL.INANIM all
'The (particular group of) wild pigs always destroys plants.'

With singular agreement, the generic/characterizing interpretation is not available; example (79) makes a claim about the habit of some individual wild pig.

79. Randip sup ifnak rokakerna ro ras
randip sup i-fnak rokakerna ro ras
pig forest 3SG-destroy plant at day
na kam
na kam
DEF.PL.INANIM all
'Some wild pig always destroys plants.'

Similarly, for predicates such as 'be everywhere', plural subjects but not singular subjects are acceptable:

80. Randip sup sro mob nakam-e
randip sup s-ro mob nakam-e
pig forest 3PL.ANIM-be.at place everywhere-FILLER
ro Papua
ro Papua
in Papua
'Wild pigs are everywhere in Papua.'
81. Randip sup si-kenem ro mob nakam ro Papua.
randip sup si-kenem ro mob nakam ro Papua
pig forest 3PL.ANIM-live at place everywhere in Papua
'Wild pigs live everywhere in Papua.'
82. *Randip sup ikenem ro mob nakam ro Papua.
randip sup i-kenem ro mob nakam ro Papua
pig forest 3SG-live at place everywhere in Papua
('One wild pig lives everywhere in Papua.')

The situation is different for kind-level predicates such as 'be extinct', which do not make statements about individuals, but only about kinds of individuals. Here, singular agreement is possible, with or without a determiner:

83. Dodo ibro kwar.
dodo i-bro kwar
dodo 3SG-extinct already
'The dodo is extinct.'
84. Man ine ryo ra idawr kwar.
man ine r<y>o ra idawr kwar
bird DEM.3SG <3SG>die until extinct already
'This (kind of) bird is already extinct.'

Dual and plural agreement are also possible in reference to more than one kind:

85. Dodo subro kwar.
dodo su-bro kwar
dodo 3DU-extinct already
'(Two kinds of) dodos are extinct.'
86. Dodo sibro kwar.
dodo si-bro kwar
dodo 3PL.ANIM-extinct already
'(The different kinds of) dodos are extinct.'

8 Conclusion

We have seen that Biak plurals in some contexts have inclusive plural readings, though in other contexts plurals must refer to four or more individuals. Thus, Biak plurals are like plurals in English or French in inclusive plural contexts, but very different in other contexts. We have also seen that dual and paucal verbs require specific subjects: we suspect that similar constraints hold more generally for minor numbers such as dual, trial, and paucal in other languages, but this needs further cross-linguistic investigation. We hope that our work will form a solid basis for further investigation of these issues, particularly in languages with more complex number systems.

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