

On the limits of number features: The case for a non-featural dual

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Abstract

This paper examines the morphological expression of dual and plural number in languages with apparent singular~dual~plural number systems and shows that the observed markedness of number features prevents them from accounting for all attested morphological patterns. I use the number systems of Slovenian, Manam and Mi'gmaq as examples for the three attested patterns I identify. I extend Nevins's (2011a) system of feature markedness to account for the Slovenian and Mi'gmaq patterns. I motivate a non-featural analysis of the Manam dual and compare its behaviour to that of non-inflectional plurals (Wiltschko, 2008; Butler, 2012).

1 Introduction

In this paper, I identify three attested patterns for the morphological expression of dual and plural number in languages with apparent singular~dual~plural number systems. I show that only two of these three patterns can be accounted for using number features. This is due to the markedness of number features, which constrains their morphological expression and that of the categories they compose. The markedness diagnostics in (1) illustrate how a feature's markedness can affect its morphological expression (adapted from Bale et al., 2011; cf. Greenberg, 1966; Croft, 1990).

(1) MORPHOLOGICAL SYMPTOMS OF MARKEDNESS

- a. Unmarked features are often not expressed by an overt morpheme.
- b. Morphemes with unmarked features often show more paradigmatic distinctions than morphemes with marked features.
- c. Forms associated with marked features often appear in fewer grammatical environments than forms associated with unmarked features.

Previous work on the featural representation of number categories has adopted the use of two bivalent features, most often called $[\pm\text{singular}]$ and $[\pm\text{augmented}]$, to represent singular~dual~plural number systems (Conklin, 1962; Noyer, 1992; Harbour, 2007; discussed further in §4.1 below). Due to the asymmetric behaviour of dual and plural with respect to cross-linguistic patterns

of syncretism (cf. (1b-c)), Nevins (2011a) argues that the marked feature values in Table 1 are universal. He formalizes this feature markedness in terms of the markedness statements in (2) and (3).

Table 1: Number categories and features

Category	Features (marked)
Singular	[+singular, –augmented]
Dual	[– singular , – augmented]
Plural	[– singular , +augmented]

(2) CONTEXT-FREE MARKEDNESS STATEMENT

The marked value of [\pm singular] is –.

(3) CONTEXT-SENSITIVE MARKEDNESS STATEMENT

In the context [–singular], the marked value of [\pm augmented] is –.

The context-sensitive markedness of [–augmented] is necessary to capture the relative markedness of singular and plural. Unlike the feature [\pm singular], which may appear on its own in singular~plural number systems, the feature [\pm augmented] always appears with another feature (here [\pm singular]) which it takes as its argument. Thus, [\pm augmented] always has some featural context which it may be sensitive to. If [–augmented] were context-free marked, singular and plural would be equally marked, each having one marked feature, and thus the asymmetric patterning of singular and plural observed cross-linguistically would be unexpected.

Nevins’s feature markedness is proposed to account for cross-linguistic patterns of syncretism which arise when the features [\pm singular] and [\pm augmented] are expressed on the same morpheme. I call this morphological pattern *simple number*. The simple number pattern appears in Slovenian.¹

¹Abbreviations in glosses are as follows: 1 = first person, 2 = second person, 3 = third person, A = set A cross-reference marker, ASSUM = assumption, AUG = augmented, COMPL = completive, DEF = definite, DIST = distal, DU = dual, EXCL = exclusive, F = feminine, INCL = inclusive, INDF = indefinite, IRR = irrealis, LN = linker, NEG = negative, OBJ = object, PFV = perfective, PL = plural, POSS = possessive, RP = resumptive pronoun, SG = singular.

(4) SIMPLE NUMBER

- a. Janez in Tone sta srečn-**a**.
John and Tony be.3DU happy-**DU**
'John and Tony are happy.'
- b. Janez in gospodje so srečn-**i**.
John and gentleman.PL be.3PL happy-**PL**
'John and the gentlemen are happy.' (Slovenian; Dvořák & Sauerland, 2006)

There is a second attested morphological pattern in which the dual is formed by the addition of a morpheme to the plural form. I call this pattern *composed dual*.² The composed dual occurs in Manam (Oceanic), where the morpheme *-ru* is added to the plural to form the dual. Nevins takes this pattern as additional evidence that dual number is composed of two marked features, as indicated in the glosses.

(5) COMPOSED DUAL

- a. áine ŋara-di-a-**ru**
woman that-3[−SG]-LN-[−AUG]
'those (two) women'
- b. áine ŋara-di
woman that-3[−SG]
'those women' (Manam; Lichtenberk, 1983)

Nevins takes the suffix *-di* to express the marked feature [−singular] and the suffix *-ru* to express the marked [−augmented] in the context [−singular].

This account of the composed dual pattern appears to be consistent with the markedness di-agnostic in (1a). The suffix *-ru* in the dual expresses the marked [−augmented] in the context [−singular], but there is no overt morpheme in the plural expressing the unmarked [+augmented]

² The terms *composed dual* and *composed plural* used in this paper are adapted from Harbour (2013). The Hopi sentences that Harbour uses to illustrate the composed dual pattern differ from the Manam example in (5) in that they involve verbal suppletion which is conditioned by the value of [±augmented], and thus the dual form is not transparently more morphologically complex than the plural. In Hopi's non-suppletive verbal paradigm, it is in fact the plural form which is more morphologically complex than the dual, being formed by the addition of a morpheme to the dual form (see Hale et al., 1991). Thus, *contra* Harbour (2013), I take the Hopi paradigm to be an example of the composed plural pattern, discussed below.

in the context [–singular].

There is a third attested morphological pattern which is unexpected by Nevins (2011a) in which the plural is formed by the addition of a morpheme to the dual form. I will call this pattern *composed plural*. The composed plural occurs in Mi’gmaq (Algonquian), where the morpheme *-ulti* is added to the dual to form the plural.³ Based on their distribution, the Mi’gmaq number morphemes in (6) can be analyzed as expressing the features shown in the glosses.

(6) COMPOSED PLURAL

- a. Mijji-oq.
eat-2[–SG]
‘You_{DU} eat.’
- b. Mijj-**ulti**-oq.
eat-[+AUG]-2[–SG]
‘You_{PL} eat.’

(Mi’gmaq; Little, 2017)

Given the markedness diagnostic in (1a), the composed plural pattern is inconsistent with the feature markedness proposed by Nevins. The suffix *-ulti* in the plural form expresses the unmarked [+augmented] in the context [–singular] and there is no overt morpheme in the dual form expressing the marked [–augmented] in the context [–singular].

Thus, given the markedness diagnostic in (1a), the existence of both composed dual and composed plural patterns constitutes an apparent paradox in the markedness of [\pm augmented] in the context [–singular]. Based on the composed dual pattern, the marked value of [\pm augmented] is –, consistent with Nevins’s proposed feature markedness. Based on the composed plural pattern, the marked value of [\pm augmented] is +, inconsistent with Nevins’s proposed feature markedness and as of yet unaccounted for.

If, as Nevins argues, the markedness of number features is universal, then only one of these two morphological patterns can be accounted for using number features and the other requires a non-featural account. Nevins’s feature system in its current state can account for the composed dual featurally, while the composed plural requires a non-featural account.

³Other languages which show the composed plural pattern include Hopi (Uto-Aztecan; Hale et al., 1991; see footnote 2), Damana (Chibchan; Harbour, 2013; Amaya, 1999), Mokilese (Oceanic; Harbour, 2013; Hutchisson, 1986), and Koryak (Chukotko-Kamchatkan; Moskal et al., 2015).

I propose a logical extension of Nevins’s feature system which can account for the composed plural featurally, while the composed dual requires a non-featural account. This reversal of the system’s coverage is the result of two independently motivated additions. First, I argue for a context-free markedness of [\pm augmented]. Second, I delimit the definition of “context” with respect to context-free vs. context-sensitive markedness.

My proposal builds on evidence I present from grammatical competition which suggests that the composed dual and composed plural patterns have distinct syntactic structures. Based on this evidence, I further propose that the composed dual pattern of Manam involves a non-featural morpheme *-ru* derived from the numeral ‘two’ (Manam *rua*), which adjoins to the constituent being marked dual. I give evidence that this adjunction is analogous to that of non-inflectional plurals (cf. Wiltschko, 2008; Butler, 2012).

The remainder of the paper is organized as follows. In section 2 I outline Nevins’s system of feature markedness and the reasoning behind it in more detail. Section 3 presents evidence that the composed dual and composed plural patterns are structurally distinct. In section 4 I advance an extension of Nevins’s feature system which allows it to account for the composed plural pattern featurally. Section 5 proposes that the composed dual pattern involves a non-featural morpheme which adjoins to the constituent being marked dual and compares this adjunction to that of non-inflectional plurals. Section 6 concludes.

2 Nevins 2011a

2.1 The system

This section gives an overview of Nevins’s evidence for the markedness of number features outlined above. The evidence comes mainly from cross-linguistic patterns of syncretism found in simple number languages such as Slovenian, in which the features [\pm singular] and [\pm augmented] are expressed on the same morpheme. Nevins takes the composed dual pattern of Manam as additional evidence in support of the feature markedness motivated by simple number languages.

In Standard Slovenian, feminine and neuter nouns in the nominative case have distinct plural morphemes, but there is syncretism between feminine and neuter in the dual. This is shown in Table 2.

Table 2: Standard Slovenian non-singular nominative

	Masculine	Neuter	Feminine
Dual	stol-a	okn- i	knjig- i
Plural	stol-i	okn-a	knjig-e
	‘table’	‘window’	‘book’

Given the diagnostic in (1b), the Standard Slovenian paradigm indicates that dual is marked relative to the plural. The plural morpheme with the unmarked feature [+augmented] shows more paradigmatic distinctions than the dual morpheme with the marked feature [–augmented]. In the environment of the marked [–augmented] (in the context [–singular]), the distinction between feminine and neuter is suppressed. Since plural lacks the marked feature [–augmented], the gender distinction remains.

In Ljubljana Slovenian, masculine nouns in the nominative case have distinct dual and plural forms, but the feminine dual neutralizes to the feminine plural. This is shown in Table 3.⁴

Table 3: Ljubljana Slovenian non-singular nominative

	Masculine	Neuter	Feminine
Dual	stol- <i>a</i>	okn- <i>a</i>	knjig- e
Plural	stol-i	okn-a	knjig- e
	‘table’	‘window’	‘book’

Given the diagnostic in (1c), the Ljubljana Slovenian paradigm indicates that dual is marked relative to plural. A distinct dual form associated with the marked feature [–augmented] does not appear in the feminine; the plural form, associated with the unmarked feature [+augmented], appears instead. In the feminine, the marked [–augmented] in the context [–singular] neutralizes to the unmarked [+augmented]. This neutralization does not occur in the masculine.

The markedness diagnostics in (1b-c) converge in providing evidence that dual is marked relative to plural. Since dual and plural differ in their value of [\pm augmented], the value [–augmented]

⁴The neuter dual also appears as though it neutralizes to the neuter plural, but it is in fact syncretic with the masculine dual in an example of the same type of syncretism shown in Table 2. For evidence that this is the case and for a more thorough and formal account of the syncretisms discussed here, see Nevins (2011a, §6).

in the dual is taken to be marked and the value [+augmented] in the plural is then unmarked.

Nevins argues that further evidence that dual number is composed of two marked features while the plural has only one comes from the Manam composed dual pattern, repeated in (7).

(7) COMPOSED DUAL

a. áine ŋara-di-a-**ru**
woman that-3[−SG]-LN-[−AUG]
'those (two) women'

b. áine ŋara-di
woman that-3[−SG]
'those women'

(Manam; =(5))

As shown in the glosses, the number morpheme that dual and plural have in common is taken to express the feature [−singular] and the additional morpheme in the dual is taken to express the marked [−augmented] in the context [−singular]. Notably, there is no overt morpheme in the plural form which expresses the unmarked value [+augmented] in the context [−singular]. Thus, given the markedness diagnostic in (1a), the composed dual pattern leads to the conclusion that the marked value of [±augmented] is −, consistent with Nevins's feature markedness.

In sum, Nevins's system of feature markedness is able to account for the composed dual pattern of Manam in addition to accounting for the patterns of syncretism in simple number languages like Slovenian.

2.2 *The puzzle*

The existence of the Mi'gmaq composed plural pattern, repeated in (8), poses a problem for Nevins's system of feature markedness.⁵

(8) COMPOSED PLURAL

a. Mijji-oq.
eat-2[−SG]
'You_{DU} eat.'

⁵Note that the data in this paper include number marking on nouns, adjectives, demonstratives, and verbs. I assume that number marking which comes about via agreement reflects the same featural contrasts as number marking on nouns.

- b. Mijj-ulti-oq.
 eat-[+AUG]-2[-SG]
 ‘You_{PL} eat.’ (Mi’gmaq; =(6))

If the composed plural is to be accounted for featurally, the number morpheme in common between dual and plural should express the feature [−singular] and the additional morpheme in the plural form should express the feature [+augmented], as represented in the glosses in (8). In Nevins’s system, [+augmented] is the unmarked value of [±augmented] in the context [−singular]. Notably, there is no overt morpheme in the dual form which expresses the marked value [−augmented] in the context [−singular]. Thus, given the markedness diagnostic in (1a), the composed plural pattern leads to the conclusion that the marked value of [±augmented] is +, contradicting Nevins’s feature markedness.

This contradiction in feature markedness is only a problem under the assumption that the markedness of number features is universal across languages. Although Nevins’s system operates under this assumption, abandoning it would appear to eliminate the problem. However, I argue here that allowing the markedness of number features to differ between languages predicts possible patterns of syncretism which appear to be unattested.

Suppose that the existence of both composed dual and composed plural patterns is due to parametric variation and there are at least two settings for the markedness of number features which vary with respect to the marked value of [±augmented] in the context [−singular]. A problem with parametric variation as an alternative to universal feature markedness is that the asymmetric behaviour of dual and plural with respect to syncretism which Nevins’s feature markedness was developed to account for appears to be unidirectional.

(9) ASYMMETRY WITH RESPECT TO SYNCRETISM (cf. (1b-c))

- a. There is more syncretism within the dual (marked) paradigm than in the plural (unmarked) paradigm.
 b. Dual (marked) neutralizes to plural (unmarked) in certain grammatical environments.

If the marked value of [±augmented] is parametrized, we expect to find languages in which the asymmetry in (9) is reversed: where plural is the marked category and dual is the unmarked

category. To my knowledge, such patterns remain virtually unattested.⁶ Thus, parametric variation in the marked value of [\pm augmented] seems unlikely.

Nevins’s system can account for simple number and composed dual featurally, while composed plural must have a non-featural account. In the following section I present evidence from grammatical competition which motivates distinct syntactic structures for the composed dual and composed plural patterns. The nature of these distinct structures suggests that the composed plural should be accounted for featurally and that the composed dual should have a non-featural account, contrary to the current coverage of Nevins’s system. Table 4 summarizes the three morphological patterns and shows which can be accounted for featurally under each analysis.

Table 4: Morphological patterns and coverage of featural analysis

Pattern	Number		Featural account?	
	Dual	Plural	Nevins (2011a)	This paper
Simple number (Slovenian)	DU	PL	✓	✓
Composed dual (Manam)	PL+DU	PL	✓	
Composed plural (Mi’gmaq)	DU	DU+PL		✓

3 Evidence from grammatical competition

Under Nevins’s feature system, the composed dual pattern can be accounted for featurally, while the composed plural pattern must have a non-featural account. In this section I present evidence for the syntactic structure of these morphological patterns which in fact motivates a featural account of the composed plural pattern (Mi’gmaq) and a non-featural account of the composed dual (Manam). This evidence comes from an extension of Katzir’s (2007) theory of scalar implicatures to grammatical competition more generally.

⁶Harbour (2003) examines syncretism in Kiowa in which plural neutralizes to dual (*contra* (9b)), but this syncretism is analyzed as involving multiple occurrences of [\pm augmented] and markedness sensitive to more context than just [–singular].

Katzir (2007) argues that the alternative utterances used in computing scalar implicatures are structurally constrained. Specifically, viable alternative utterances must be at most as structurally complex as the original utterance. In their analysis of the singular~plural distinction in Western Armenian, Bale & Khanjian (2014) extend this constraint on alternative utterances from scalar implicatures to grammatical competition more generally. This extension of Katzir’s constraint allows it to be applied to number distinctions in other languages as well.

3.1 *Simple number*

In their account of the Slovenian dual~plural distinction, Dvořák & Sauerland (2006) follow Sauerland (2003) in arguing that the meanings of number categories are presuppositional. In particular, they argue that plural presupposes nothing and that dual presupposes that its referent consists of at most two singular parts. They make use of Heim’s (1991) principle of Maximize Presupposition. The principle requires that when faced with a choice between multiple lexical items with differing presuppositions, a speaker must use the lexical item with the strongest presupposition they know to be satisfied.

Given that dual has a presupposition and plural does not, dual has the stronger presupposition by default. Choosing between dual and plural, Maximize Presupposition results in the ungrammaticality of plural agreement if the subject satisfies the presupposition of dual. This is illustrated by the Slovenian example in (10).

- (10) a. Janez in Tone sta srečn-**a**.
 John and Tony be.3DU happy-**DU**
 ‘John and Tony are happy.’
- b. *Janez in Tone so srečn-**i**.
 John and Tony be.3PL happy-**PL**
 Intended: ‘John and Tony are happy.’ (Slovenian; Dvořák & Sauerland, 2006)

Since the subject in (10) consists of two singular parts, it satisfies the presupposition of dual, resulting in dual morphology in (10a). The plural morphology in (10b) results in ungrammaticality because the stronger presupposition of dual is satisfied and so the dual morphology must be used.

Applying Katzir’s constraint on alternative utterances to Maximize Presupposition restricts the set of lexical items that the speaker must choose between. Given that Maximize Presupposition

applies in choosing between the sentences in (10), it must be the case that dual and plural are at most equally structurally complex. Since there is syncretism between dual and plural morphemes in Slovenian as seen in Section 2, I assume they occupy the same structural position. Thus, there is no reason to posit more structure in the dual than in the plural or vice versa.

3.2 Composed dual

Unlike the Slovenian simple number pattern, plural marking in the Manam composed dual pattern is compatible with referents that consist of two singular parts: “the plural can be considered to be ‘unmarked’ in the sense that it can be used in place of the dual” (Lichtenberk, 1983:109).⁷ As seen in (10) above, this is not true of Slovenian, in which the plural cannot be used in place of the dual.

- (11) Floréns ŋe ábe Boʔém-be ʔúlu di-doʔ-í-a-**ru**.
 Florence RP already Bokeng-and Kulu 3[−SG]-take-3[+SG]-LN-[−AUG]
 ‘As for Florence, she has been adopted by Bokeng and Kulu.’ (Manam; Lichtenberk, 1983)

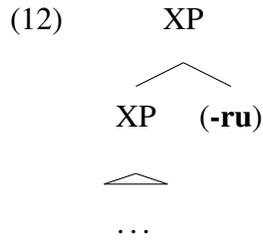
The subject of the Manam sentence in (11), ‘Bokeng and Kulu’, consists of two singular parts and dual marking appears on the verb. The dual marking is composed from the [−singular] subject prefix *di-* and the “dual” suffix *-ru*, glossed as [−augmented] following Nevins’s analysis.

Extending Dvořák & Sauerland’s (2006) presuppositional analysis to Manam, the plural form presupposes nothing and the dual form with *-ru* presupposes that its referent consists of at most two singular parts. The acceptability of the plural used in place of the dual in Manam then indicates that a sentence using the stronger dual form is not a viable alternative utterance to a sentence using the plural form. Otherwise, Maximize Presupposition would require that a speaker utter the stronger dual sentence, resulting in the unacceptability of the plural sentence, as in Slovenian in (10). Given the structural constraint on alternative utterances, this suggests that the Manam dual is more structurally complex than the plural. I propose that the Manam morpheme *-ru* is adjoined to

⁷Lichtenberk gives no conditions on the use of the plural in place of the dual in Manam. Thus, the sentence in (i) can be extrapolated from (11), using the plural in place of the dual.

- (i) Floréns ŋe ábe Boʔém-be ʔúlu di-doʔ-i.
 Florence RP already Bokeng-and Kulu 3[−SG]-take-3[+SG]
 ‘As for Florence, she has been adopted by Bokeng and Kulu.’

the structure of the word it marks as dual.



The tree in (12) illustrates the adjunction of *-ru* to the word being marked dual. The inner structure of the word is below the lower XP node and *-ru* adjoins to this structure. In the plural there is no *-ru* adjunct and thus less structure. The use of the plural in place of the dual shows the optionality and adjunct-like nature of *-ru*, which marks the dual on both verbs, as in (11), and demonstratives, as in (5). Unlike the Slovenian simple number pattern, the dual in the Manam composed dual is more structurally complex than the plural.

3.3 Composed plural

In this section I show that the Mi'gmaq composed plural is like the Slovenian simple number pattern and unlike the Manam composed dual in that the dual and plural forms are equally structurally complex.

Mi'gmaq exhibits a two-way number contrast on transitive verbs as in (13) and a three-way contrast on intransitive verbs as in (14), where the composed plural appears.⁸

- (13) a. Mu nem-i'li-w-n.
 NEG see-1OBJ-NEG-2[+SG]
 'You_{SG} don't see me.'
- b. Mu nem-u'ln-u-oq.
 NEG see-2OBJ-NEG-2[-SG]
 'I don't see you_{PL}.'
- (Mi'gmaq; Coon & Bale, 2014; Little, 2017)

⁸Coon & Bale (2014) account for the absence of the suffix *-ulti* in the transitive paradigm by arguing for the fusion of its head, a number probe, with a head probing for person features (see the proposed clause structure in (16) below). This fused probe is used to account for the hierarchy effects that determine which argument controls agreement on the transitive verb seen in (13).

- (14) a. **Mijji-n.**
eat-2[+SG]
'**You_{SG}** eat.'
- b. **Mijji-oq.**
eat-2[-SG]
'**You_{DU}** eat.'
- c. **Mijj-ulti-oq.**
eat-[+AUG]-2[-SG]
'**You_{PL}** eat.'

(Mi'gmaq; Little, 2017)

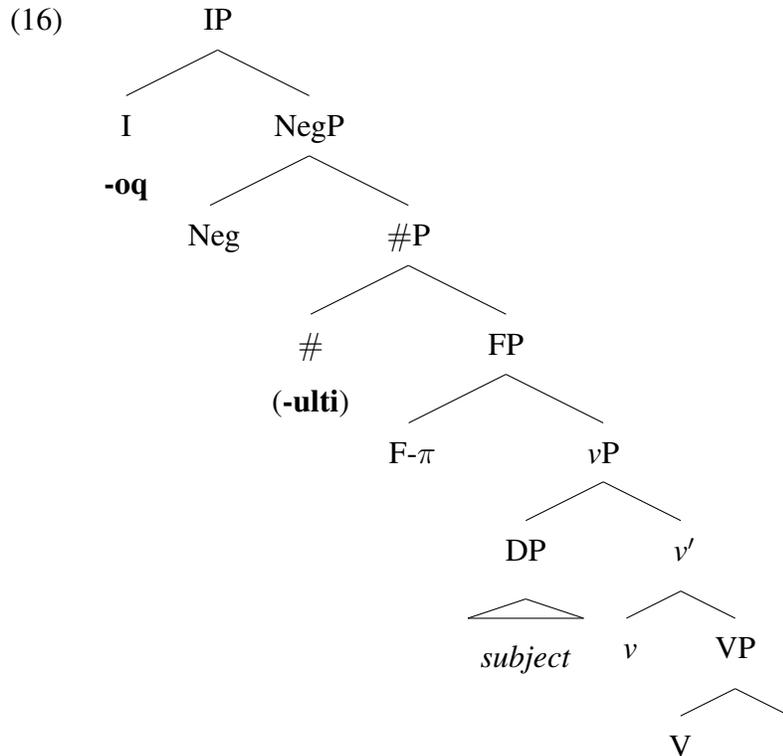
Notably, the second person [-singular] morpheme *-oq* is interpreted as plural in transitive verbs, where the suffix *-ulti* is unavailable. When the suffix *-ulti* is available (i.e., in intransitive verbs), *-oq* on its own gets a dual interpretation and is ungrammatical if the subject consists of more than two singular parts.

- (15) a. *Gilew aq Mali mijji-oq.
2[-SG] and Mary eat-2[-SG]
Intended: 'You_[-SG] and Mary eat.'
- b. Gilew aq Mali mijj-ulti-oq.
2[-SG] and Mary eat-[+AUG]-2[-SG]
'You_[-SG] and Mary eat.'

(Mi'gmaq; Bale, p.c.; cf. Bale, 2014)

Suppose that, as Dvořák & Sauerland (2006) propose for the Slovenian plural, the Mi'gmaq suffix *-oq* on its own in the dual presupposes nothing and the plural form with the additional suffix *-ulti* presupposes that the referent consists of more than two singular parts. Given these presuppositions, the data in (15) can be accounted for by Maximize Presupposition. The stronger presupposition of the plural form with *-ulti* is satisfied and so it must be used.

Given that Maximize Presupposition applies in choosing between the sentences in (15), it must be the case that the two forms are at most equally structurally complex. Although the plural form has more overt morphology than the dual form, Coon & Bale (2014) propose a single structure for Mi'gmaq intransitive clauses which is compatible with both dual and plural forms.



In Coon and Bale’s structure the additional morpheme *-ulti* in the plural form occupies a # head which remains part of the clause structure in the dual form. There is thus no additional structure in the plural, and the dual and plural are equally structurally complex.

Given an extension of Katzir’s (2007) structural constraint on alternatives, dual and plural have the same amount of structure in Slovenian and Mi’gmaq, while dual has more structure than plural in Manam. This result demonstrates that the Manam composed dual is the odd pattern out and should have a different analysis from simple number and composed plural. Given that simple number is featural, I conclude that composed plural is also featural and that composed dual requires a non-featural account.

4 The proposal

Nevins’s feature system in its current state can account for the composed dual pattern featurally, while the composed plural requires a non-featural account. In the previous section I gave evidence from grammatical competition that the composed plural should be accounted for featurally and the composed dual requires a non-featural account. This is consistent with facts about the Manam

“dual” morpheme *-ru*, derived from the Manam numeral ‘two’, *rua* (Lichtenberk, 1983:46). The previous section revealed that *-ru* is optional, and that it exhibits promiscuous attachment to both verbs and demonstratives. Section 4.2 further explores these facts.

In this section I propose a logical extension of Nevins’s feature system which can account for the composed plural featurally, while the composed dual requires a non-featural account. This reversal of the system’s coverage is the result of two motivated additions. First, I argue for a context-free markedness of [\pm augmented]. Second, I delimit the definition of “context” with respect to context-free vs. context-sensitive markedness.

4.1 *Context-free markedness of [\pm augmented]*

The system as outlined above lacks a context-free markedness for the feature [\pm augmented]. In earlier work on number features, Nevins (2008) says that “neither value of [\pm augmented] is inherently marked.” This statement predicts that there is no behavioural asymmetry between the values of [\pm augmented] outside the context of [$-$ singular]. Upon examination of languages in which [\pm augmented] appears without [\pm singular], this prediction is shown to be false.

The features [\pm singular] and [\pm augmented] are used independently of one another to account for different number systems. The feature [\pm singular] on its own accounts for singular~plural number systems like the one in English. The feature [\pm augmented] is always relativized to one or more other features and further constrains the referent in terms of the feature(s) it is relativized to. The value [$-$ augmented] picks out a referent which minimally satisfies the feature(s) it is relativized to and the value [$+$ augmented] indicates non-minimal satisfaction of the feature(s) it is relativized to. In singular~dual~plural number systems, [\pm augmented] is relativized to [\pm singular]. Dual, expressed by the features [$-$ singular, $-$ augmented], is then the minimal non-singular, picking out exactly two individuals.

The feature [\pm augmented] was originally developed to account for minimal~augmented number systems (Conklin, 1962). Minimal~augmented is only distinguishable from singular~plural in languages with a clusivity contrast, a grammatical distinction between groups including both the speaker and the addressee (inclusive) and those including the speaker and excluding the addressee (exclusive). In such languages there is an apparent dual which appears only in the first person inclusive. This pattern is exemplified by Winnebago (Lipkind, 1945:24; Harbour, 2011).

Table 5: Winnebago agreement with traditional categories

	Singular	Dual	Plural
1INCL	–	hin-	hin- -wi
1EXCL	ha-		ha- -wi
2	ra-		ra- -wi
3	∅-		∅- -ire

Table 6: Winnebago agreement with [\pm augmented]

	[–augmented]	[+augmented]
1INCL	hin-	hin -wi
1EXCL	ha-	ha- -wi
2	ra-	ra- -wi
3	∅-	∅- -ire

Harbour (2011) identifies three problems with describing Winnebago agreement in terms of the traditional categories as in Table 5. First, dual occurs exactly once in Winnebago. Second, dual occurs in the first person inclusive, where reference to at least two individuals, the speaker and the addressee, is already required. Third, this description causes the use of the morpheme *-wi* to be inconsistent between more than two referents in first person inclusive and more than one referent in all other persons.

Accounting for Winnebago agreement in terms of the feature [\pm augmented] as in Table 6 resolves all of these problems. In this account, [\pm augmented] is relativized to the person features of each category. The value [–augmented] then picks out the referents that minimally satisfy the person specifications. The [–augmented] first person inclusive involves the speaker and the addressee, thus the apparent dual follows from the nature of the first person inclusive. The [–augmented] first person exclusive involves only the speaker, so there is no apparent dual. The value [+augmented] corresponds to non-minimal satisfaction of the person specifications and is expressed in Winnebago by the morpheme *-wi*, giving this morpheme a homogeneous distribution.

The account of Winnebago agreement in Table 6 also reveals a possible asymmetry between the values of [\pm augmented] outside the context of [–singular] which could be consolidated with more

cross-linguistic evidence. The [+augmented] agreement is expressed by the suffix *-wi*, while there is no such suffix in the [–augmented] agreement paradigm. Following the markedness diagnostic in (1a), this asymmetry is consistent with the marked value of [±augmented] being +. Given this asymmetry, I propose the context-free markedness statement for [±augmented] in (17) and keep the context-sensitive markedness statement, repeated in (18).

(17) CONTEXT-FREE MARKEDNESS STATEMENT FOR [±AUGMENTED]

The marked value of [±augmented] is +.

(18) CONTEXT-SENSITIVE MARKEDNESS STATEMENT FOR [±AUGMENTED]

In the context [–singular], the marked value of [±augmented] is –.

The fact that the same feature has both context-free and context-sensitive markedness raises the question of when [±augmented] is in the context [–singular] and when it is not, which we turn to below.

4.2 *Delimiting context*

A clear case of [±augmented] in the context [–singular] is when the features are expressed on the same morpheme. The simple number pattern of Slovenian, repeated in (19), illustrates this state of affairs.

(19) SIMPLE NUMBER

a. Janez in Tone sta srečn-**a**.
John and Tony be.3DU happy-**DU**
'John and Tony are happy.'

b. Janez in gospodje so srečn-**i**.
John and gentleman.PL be.3PL happy-**PL**
'John and the gentlemen are happy.'

(Slovenian; Dvořák & Sauerland, 2006)

As discussed in section 2, Nevins (2011a) proposes the context-sensitive markedness of [±augmented] specifically to account for the patterns of syncretism that occur in simple number languages like Slovenian. Nevins works in Distributed Morphology (Halle & Marantz, 1993), in which each morpheme corresponds to a “bundle” of features. Thus, any feature in the same feature bundle as

[−singular] is in the context [−singular].

Nevins takes the composed dual pattern of Manam, repeated in (20), as another example showing the context-sensitive markedness of [±augmented].

(20) COMPOSED DUAL

a. áine ŋara-di-a-**ru**
woman that-3[−SG]-LN-[−AUG]
‘those (two) women’

b. áine ŋara-di
woman that-3[−SG]
‘those women’

(Manam; Lichtenberk, 1983)

The morpheme *-ru* in the dual is taken to express the marked [−augmented] in the context [−singular]. Since [−augmented] and [−singular] are expressed on different morphemes in this pattern, it must be the case that features outside the feature bundle containing [−singular] can be in the context [−singular] for this analysis to be correct.

Suppose that another way for a feature to be in the context [−singular] is for it to be in a feature bundle which is adjacent to the feature bundle containing [−singular]. This definition of context could account for the Manam composed dual pattern in (20). It can be argued that since the linker morpheme separating the morphemes expressing [−singular] and [−augmented] is semantically null (“epenthetic morphological buffer”; Lichtenberk, 1983), it has no corresponding feature bundle in the structure and is inserted in the phonological component. It could follow then that there is no feature bundle separating [−singular] and [−augmented] and so [−augmented] is in the context [−singular] under this definition.

An issue with appealing to adjacency in the definition of context is that it has not been established how Manam words are derived, nor at what stage in the derivation context is calculated. For the sake of argument, let us take linear adjacency of morphemes to be equivalent to structural adjacency at surface structure and take context to be calculated from surface structure.

This definition of context is still not sufficient to account for the composed dual pattern of Manam. As shown by the Manam verbs in (21), it is possible for the morpheme *-ru*, taken to express the marked [−augmented] in the context [−singular], to be separated from the morpheme

tion of context in which two features are in the same context if and only if they are members of the same feature bundle. Following this definition, I further propose that the Manam morpheme *-ru* in the composed dual does not express the marked [–augmented] in the context [–singular], but instead brings about dual meaning through its origin as the numeral ‘two’, Manam *rua*.

Although it removes the possibility of a featural account for the Manam composed dual, the adoption of a strict definition of context limited to feature bundles allows the composed plural pattern of Mi’gmaq, repeated in (22), to be accounted for featurally.

(22) COMPOSED PLURAL

- a. Mijji-oq.
eat-2[–SG]
‘You_{DU} eat.’
- b. Mijj-**ulti**-oq.
eat-[+AUG]-2[–SG]
‘You_{PL} eat.’

(Mi’gmaq; Little, 2017)

Since [+augmented] and [–singular] are expressed on different morphemes in this pattern, it follows that they are members of different feature bundles and that [+augmented] is outside the context [–singular]. It follows further that [+augmented] is subject to the context-free markedness of [±augmented], under which it is the marked value. Thus, the Mi’gmaq morpheme *-ulti* in the plural expresses the marked feature [+augmented] and the unmarked [–augmented] in the dual is not expressed by an overt morpheme.

Table 7: Morphological patterns and coverage of featural analysis (=Table 4)

Pattern	Number		Featural account?	
	Dual	Plural	Nevins (2011a)	This paper
Simple number (Slovenian)	DU	PL	✓	✓
Composed dual (Manam)	PL+DU	PL	✓	
Composed plural (Mi’gmaq)	DU	DU+PL		✓

To recap, the system of feature markedness put forward by Nevins (2011a) accounts for the simple number and composed dual patterns, but leaves the composed plural pattern needing a non-featural account. Adding context-free markedness of [\pm augmented] and limiting context to feature bundles allows the system to account for the simple number and composed plural patterns, leaving the composed dual in need of a non-featural account.

5 Non-featural dual

The previous section extended Nevins’s system to allow it to account for the composed plural pattern and concluded that the composed dual pattern requires a non-featural account. This section explores the nature of this non-featural dual and compares it to the non-inflectional plural of Yucatec Maya.

5.1 Dual without [\pm singular]

In Nevins’s featural analysis of the Manam composed dual, the dual form was composed of a morpheme expressing the feature [$-$ singular] and the suffix *-ru*, which was taken to express the feature [$-$ augmented], resulting in the feature specification [$-$ singular, $-$ augmented] for dual number. The Australian aboriginal language Warrwa (Nyulnyulan) has a dual morpheme *-wili*, similar to Manam *-ru*, but otherwise employs a minimal~augmented number system like that of Winnebago in §4.1, expressing the feature [\pm augmented]. The result is a language with an apparent dual, but no feature [\pm singular] to compose it featurally. I thus take the Warrwa pattern given in Table 8 as evidence in support of a non-featural analysis of Manam *-ru*.

Table 8: Warrwa nominative free pronouns (McGregor, 1994)

	[$-$ augmented]	[$+$ augmented]	Dual
1INCL	yawu	yadirr	–
1EXCL	ngayu	yaarra	yaarra- wili
2	juwa	kurra	kurra- wili
3	kinya	yirra	yirra- wili

Note that there is no dual form in the first person inclusive, precisely where the [$-$ augmented]

form *yawu* already has two referents: the speaker and the addressee.

5.2 *A cross-linguistic sketch*

Since the Manam dual suffix *-ru* is not featural, its dual meaning must have a non-featural source. I propose that the dual interpretation of *-ru* comes from its origin as the Manam numeral ‘two’, *rua*. The relation between *-ru* and *rua* is supported by Manam’s “paucal” morpheme *-to*, which behaves exactly as *-ru* does morphologically and is derived from the numeral ‘three’, *toli*. Table 9 shows the Manam numerals in a side-by-side comparison with these derived suffixes.

Table 9: Manam numerals and derived number morphemes

Gloss	Numeral	Derived morpheme	
‘one’	<i>teʔe</i>		
‘two’	<i>rua</i>	<i>-ru</i>	“dual”
‘three’	<i>toli</i>	<i>-to</i>	“paucal”
‘four’	<i>wati</i>		
‘five’	<i>lima</i>		

The characteristics of each language described in this paper generalize to other languages with the same morphological patterns. This generalization is supported by previous research. For example, the characteristics of Slovenian are observed to apply to other simple number languages (cf. Nevins, 2011a). In his volume on grammatical number, Corbett (2000) identifies three languages which pattern semantically like Manam in that the plural can be used in place of the dual: Larike (Laidig & Laidig, 1990), Longgu (Hill, 1992) and Marshallese (Bender, 1969). The dual in all three languages is formed using a morpheme derived from the numeral ‘two’. Similar semantic behaviour has also been observed in Tok Pisin (Krifka, 2006), where the “dual” marker *-tu* is clearly derived from the numeral ‘two’, remaining identical to it.

5.3 *Analogy with non-inflectional plural*

The composed dual of Manam is strikingly similar to the non-inflectional plural of Yucatec Maya discussed by Butler (2012). Non-inflectional plurals are examined in-depth by Wiltschko (2008). Like my proposal for Manam *-ru*, non-inflectional plurals are adjuncts.

In Yucatec Maya (YM), plural marking is ambiguous in its possible interpretations. The invariant plural morpheme *-o'ob* can be used to mark the plurality of nouns, cross-reference plural third person arguments on verbs, and mark third person plural possessors.

(23) u péek-**o'ob**
 A3 dog-**PL**
 'their dog'/'his dogs'/'their dogs' (YM; Lucy, 1992)

(24) T-u bis-aj-**o'ob**.
 PFV-A3 carry-COMPL-**PL**
 'S/he took them.'/'They took it.'/'They took them.' (YM; Lucy, 1992)

Plural marking in third person possessive constructions as in (23) can denote the plurality of the possessor, the head noun, or both. When both the subject and object of a transitive verb are third person as in (24), plural marking can indicate the plurality of the subject, the object, or both arguments of the verb.

Plural marking is not necessary for plural interpretation in YM. The presence of the plural morpheme *-o'ob* forces a plural reading.

(25) a. le x-ch'úupal-o'
 DEF F-girl-DIST
 'the girl'/'the girls'
 b. le x-ch'úupal-**o'ob**-o'
 DEF F-girl-**PL**-DIST
 'the girls' (YM; Butler, 2012)

The example without plural marking in (25a) is compatible with both singular and plural interpretations. The example with plural marking in (25b) is only compatible with a plural interpretation.

The Manam dual morpheme *-ru*, like YM plural *-o'ob*, has no other allomorphs or irregular forms. It can be used to mark dual nouns, indicate dual arguments on verbs, and mark dual possessors.

(26) a. áine ŋara-di-a-**ru**
 woman that-3[−SG]-LN-**RU**
 'those (two) women'

- b. tina-di-a-**ru**
 mother-3[−SG]-LN-**RU**
 ‘their (two) mother’
- c. ʔaníʒa ʔán-da-**ru**
 food POSS-1[−SG].INCL-**RU**
 ‘our (two) food’

(Manam; Lichtenberk, 1983)

- (27) ʔi-te-dí-a-**ru**.
 1[−SG].EXCL-see-3[−SG]-LN-**RU**
 ‘We (two) saw them (two).’

(Manam; Lichtenberk, 1983)

Dual marking of nouns can appear on demonstratives, as in (26a). Number morphology attaching directly to the noun as in (26b) indicates inalienable possession of the noun and marks the number of the possessor. Alienable possession in (26c) involves an additional morpheme which the number morphology attaches to, again marking the number of the possessor. When both the subject and object of a transitive verb are [−singular] as in (27), the suffix *-ru* can mark either or both arguments as dual.

Dual marking is not obligatory with dual referents in Manam. As discussed in §3.2, the plural can be used in place of the dual.

- (28) a. áine ʒara-di-a-**ru**
 woman that-3[−SG]-LN-**RU**
 ‘those (two) women’
- b. áine ʒara-di
 woman that-3[−SG]
 ‘those women (two or more)’

(Manam; Lichtenberk, 1983)

The example without *-ru* in (28b) is compatible with two or more referents. The example with *-ru* in (28a) is only compatible with two referents.

In sum, both Manam *-ru* and YM non-inflectional plural *-o’ob* are invariant in their form. Both mark the dual/plural number of nouns, indicate the dual/plural number of arguments on verbs, and mark the dual/plural number of possessors. Neither form of number marking is obligatory, but both can serve to specify the desired interpretation. Non-inflectional plurals like that of YM are adjuncts, as I propose is the case for Manam *-ru*.

6 Conclusion

In this paper I identified three morphological patterns for dual and plural number in languages which distinguish them: simple number, composed dual and composed plural. I showed that the existence of both composed dual and composed plural patterns forms an apparent paradox in the markedness of the feature [\pm augmented]. Using evidence from grammatical competition, I argued that the system of feature markedness proposed by Nevins (2011a) does not adequately resolve this paradox. I proposed an extension to Nevins's system which left the composed dual in need of a non-lexical account. Comparing the composed dual to the Yucatec Maya non-inflectional plural, I proposed an analogous "non-inflectional dual", an adjunct derived from the numeral 'two'.

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