Nominal inflection classes in verbal paradigms

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Abstract It is not uncommon for inflected nominal forms to be incorporated into verbal paradigms, as in Imonda progressive construction *tōbtō soh-ia ale-f* ‘he is looking for fish (lit. fish search-LOC stay-PRS)’, where the verbal noun ‘search’ is in the locative case. Equally, nominal inflection classes are not uncommon. But the two rarely cooccur. We present two case studies (the only examples we are aware of) as a contribution to the typology of inflection class systems: the Western Nilotic language Nuer, and Old Irish. In these languages nominal inflection class distinctions in case marking have become part of the verbal paradigm through the incorporation of constructions involving deverbal nouns. This provides a unique context for observing the properties of inflection classes. In Nuer, case inflection of the verbal noun can be deduced through a cascading series of implicatures, laying bare processes which are entirely covert in the ordinary noun system. With Old Irish, its transition to the modern period was accompanied by a split in the behaviour of verbal nouns, whose inflection class system was simplified when used verbally, but left intact in other contexts, showing that incorporation into the verbal paradigm had real effects on the system.

Keywords Inflection class · Verbal noun · Nuer · Irish

Selected abbreviations

AP antipassive
APPL applicative

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BARE	unsuffixed finite form used with an immediately following overt subject
CP	centripetal
MUL	multiplicative
NF	non-finite form (used with all auxiliaries except for PRS NEG)
NF NEG	non-finite form used with the PRS NEG auxiliary
TR	transitive

1 Introduction

We start with two observations. The first is that case-inflected nominal forms may be employed in verbal constructions. For example in Latin, participles (verbal adjectives) feature in a number of periphrastic constructions, as in (1), where the nominative case participle in conjunction with the copula forms the perfect. In Imonda, a Papuan language of the Border family, progressives are formed by combining the verb ‘stay’ with a verbal noun in the locative case (2). In the Mongolic language Buryat, nominalized verb forms serve various converbial functions (Skribnik 2003:116), as in (3), where the verb takes an ablative case ending to convey the meaning ‘since’. The second observation is that inflected nominals may fall into different inflection classes; that is, that different sets of words show different morphological realizations of what are otherwise the same morphosyntactic values.

- (1) Latin
laudat-a est
praise.PTCP.PRF-F.SG.NOM is
'she has praised'
- (2) Imonda (Seiler 1985:72, cited by Heine and Kuteva 2002)
tōbtō soh-ia ale-f
fish search-LOC stay-PRS
'he is looking for fish'
- (3) Buryat (Skribnik 2003:122)
shi yere-hen-hee
you come-FUT-ABL
'since you have come'

If these two observations are combined, then in principle one should expect to find nominal inflection classes incorporated into verbal paradigms through the use of inflected nominal forms. To the best of our knowledge this is a possibility which has not been explicitly discussed in the literature before, probably because no examples were forthcoming. As a consequence there is a gap in the typology of inflection class systems. We propose here to expand the range of known inflection class systems by describing the only good examples we are aware of: the Western Nilotic language Nuer, and Old Irish (continuing into the Middle Irish period), prompted by our having observed this phenomenon in the course of research on Nuer.¹

¹ The Nuer facts were suggested by a handful of examples in Crazzolara (1933:139f), remarked on by Baerman (2013), but the full extent has only become apparent as a result of the fieldwork reported here.

In both these languages case-inflected nouns play an important role in the verbal paradigm, and fall into the inflection classes typically found in the noun system. This provides a novel vantage point for looking at inflection classes. Because they have a systematic connection to another word class, that means that they are not just a property of the word class that normally contains them, but also exist as part of a larger system, in this case the verbal paradigm. The case studies presented here enable us to make two interesting observations. In Nuer, the inner workings of inflection class assignment are laid bare: the verbally-employed nouns constitute a microcosm of the inflection class system as a whole, but one in which there is a consistent morphological back-story to each and every lexeme (namely, the verbal paradigm), unlike what one finds in the opaque system found in other nouns. With Old Irish, the diachronic developments going into the modern period suggest that association with the verbal paradigm has led to a reduction or loss of inflection class distinctions in verbal nouns, while they retain these distinctions when used outside of verbal contexts.

This paper is structured as follows. Section 2 lays out the Nuer facts, showing the role of case-inflected verbal nouns (*gerunds* in our terminology, to distinguish them from other types of verbal nouns) in the verbal paradigm, how they are derived from the verb stem, and how they recapitulate the four case inflection patterns found elsewhere in the noun system. Section 3 presents the comparable situation in Old/Middle Irish, and shows how verbal nouns have split in Modern Irish: inflection class distinctions are retained when they are used as ordinary nouns, but lost when they are used in verbal constructions. Section 4 concludes, pointing out the typological and theoretical observations that can be drawn from this seemingly rare phenomenon.

2 The Nuer language

Nuer is a Western Nilotic language of the Dinka-Nuer subgroup spoken in the Republic of South Sudan and Ethiopia by anywhere from 900,000 to well over two million speakers.² Nuer has a number of dialects that can be separated into two broad varieties which we term Western Nuer and Eastern Nuer. Western Nuer, also known as Bentiw, is spoken in Ruweng, Northern Liech and Southern Liech States of South Sudan. Eastern Nuer is spoken over a vast geographical stretch – in Western Bieh (Fangak), Eastern Nile, Latjoor, Eastern Bieh and Jongley States of South Sudan and the Gambella region of Ethiopia. Many South Sudanese Nuer live abroad due to a persistent unrest in the native territories. Large Nuer settlements can be found in the U.S.A. and Australia as well as in Eastern Africa. Previous studies include Crazzo-

The Old Irish facts are of course familiar within Celtic and Indo-European studies, but their typological oddity (even within Indo-European) does not appear to have been a topic of concern. We also recognize that the nominals used in Latin verbal constructions belong to different inflection classes, e.g. the gerund inflects as a second declension noun and the supine as a fourth declension noun. But in the context of the verbal paradigm these are no longer inflection class distinctions, because it is same for every verb: inflecting as second declension noun is a property of *all* gerunds, and inflecting as a fourth declension noun is a property of *all* supines.

²The lower figure comes from Simons and Fennig (2017), the higher one from the Joshua Project (joshuaproject.net/people_groups/13909/OD_ET).

lara (1933), Vandevort (n.d.), Yigezu (1995), Storch (2005), Frank (1999), Baerman (2012) and Faust (2017), among others.

Some preliminaries about the vocalic system and associated suprasegmental features are necessary in order to describe the morphological alternations. Like many other Western Nilotic languages, Nuer distinguishes three degrees of vowel length, which we refer to as short, long and overlong, and represent with one to three vowel graphemes. (Diphthongs are represented as digraphs, with length indicated by the non-initial component.) Voice quality is also distinctive: breathy voice is indicated by two subscript dots, while modal voice (the unmarked phonation type, which may tend towards creakiness), is not overtly represented. There are three phonemically distinct tones (tonemes): low ($\check{v}$), rising ($\acute{v}$), and one which for convenience we will call high, but which is only realized as high with breathy vowels ($\acute{v}$), while with modal vowels it is falling ($\grave{v}$). Tone is represented just on the first vowel grapheme of any graphic sequence of vowels. Tone does not play a role in the account to follow.³

2.1 Case inflection and the gerund

Nouns in Nuer inflect for three cases: nominative, genitive and locative, whose use we illustrate here with the noun ‘home’. The nominative is in effect the default case, used both for subject and for object, as in (4), among other things. The genitive is used in adnominal constructions, as in (5), where it is the complement of the gerund ‘thinking about’ (thus literally ‘I want the thinking about of the home.’). The locative indicates location, as in (6), where it is used in conjunction with the uninflected copula, or goal of motion, as in (7).

- (4) câaar- $\grave{a}$ cjêeŋ
 think.about.TR-1SG home.NOM.SG
 ‘I am thinking about home.’
- (5) gôoor- $\grave{a}$ cǎar cjêeŋ
 want.TR-1SG thinking.about.NOM.SG home.GEN.SG
 ‘I want to think about home.’
- (6) uɿ́n à cjéŋ
 I.NOM.SG COP home.LOC.SG
 ‘I am at home.’
- (7) uɿ́n rîeŋ- $\grave{a}$ cjéŋ
 I.NOM.SG run.IN-1SG home.LOC.SG
 ‘I am running home.’

The parallel constructions with a gerund in place of an ordinary noun are shown in (8)–(11), using the verb ‘kick’. In (8) it is the nominative object of the verb ‘want’, and itself takes a genitive complement. In (9) it is the genitive complement of the gerund ‘thinking about’, which itself is the nominative object of ‘want’. These two patterns are the usual way of making one verb the complement of another. In (10),

³Tone is the object of ongoing work and we cannot claim to have fully understood it. In addition, there is a fair amount of variation between speakers and/or varieties. In such cases we have represented the tones observed for one reference speaker.

following a cross-linguistically familiar pattern, the locative forms the basis of a progressive construction, (thus literally ‘Bool is on kicking of the person’), while in (11) it expresses purpose as the complement of a verb of motion.

- (8) câaar- λ kwê $\bar{t}$ rân
 think.about.TR-1 SG kicking.NOM.SG person.GEN.SG
 ‘I am thinking about kicking the person.’
- (9) gôoor- λ cǎar kwê $\bar{t}$ rân
 want.TR-1 SG thinking.about.NOM.SG kicking.GEN.SG person.GEN.SG
 ‘I want to think about kicking the person.’
- (10) ʔɛ́n à kwê $\bar{t}$ rân
 I.NOM.SG COP kicking.LOC.SG person.GEN.SG
 ‘I am kicking the person.’
- (11) ʔɛ́n rîeŋ- λ kwê $\bar{t}$ rân
 I.NOM.SG run.IN-1 SG kicking.LOC.SG person.GEN.SG
 ‘I am running to kick the person.’

Note that the nominative of ‘kicking’ is identical to the genitive. Gerunds typically display syncretism of two out of the three cases, but which cases those are depends on inflection class. In order to demonstrate the validity of the three-way case distinction, we repeat (8)–(10) with the gerunds of two other verbs: (12)–(14) show a gerund with nominative/locative syncretism, and (15)–(17) show a gerund with genitive/locative syncretism.

- (12) câaar- λ nǎk rân
 think.about.TR-1 SG killing.NOM.SG person.GEN.SG
 ‘I am thinking about killing the person.’
- (13) gôoor- λ cǎar nǎk rân
 want.TR-1 SG thinking.about.NOM.SG killing.GEN.SG person.GEN.SG
 ‘I want to think about killing the person.’
- (14) ʔɛ́n à nǎk rân
 I.NOM.SG COP killing.LOC.SG person.GEN.SG
 ‘I am killing the person.’
- (15) câaar- λ néer rân
 think.about.TR-1 SG greeting.NOM.SG person.GEN.SG
 ‘I am thinking about greeting the person.’
- (16) gôoor- λ cǎar néer- λ rân
 want.TR-1 SG thinking.about.NOM.SG greeting-GEN.SG person.GEN.SG
 ‘I want to think about greeting the person.’
- (17) ʔɛ́n à néer- λ rân
 I.NOM.SG COP greeting-LOC.SG person.GEN.SG
 ‘I am greeting the person.’

Typically, the gerund is a singular noun form. However, if the verb is multiplicative (a derived verbal category which indicates that the action is performed multiple times;

see (25)), a plural noun form is used instead; examples (18)–(20) give the multiplicative equivalents of (8), (9) and (11). (Note that plural case is not distinguished in the particular nominal pattern that gerunds follow.)

- (18) gôoor-_l kwéd-ní nâaat
 want.TR-1SG kicking-PL person.GEN.PL
 ‘I want to kick people many times.’
- (19) gôoor-_l cǎar kwéd-ní nâaat
 want.TR-1SG thinking.about.NOM.SG kicking-PL person.GEN.PL
 ‘I want to think about kicking people many times.’
- (20) ʷán ríɛŋ-_l kwéd-ní nâaat
 I.NOM.SG run.IN-1SG kicking-PL person.GEN.PL
 ‘I am running to kick people many times.’

Although gerunds are nominalizations, we hold that the forms illustrated here still constitute a part of the verbal paradigm. As shown in Sects. 2.2–2.3, gerunds are productive and available to every verb, and they are required to form a progressive construction, and to allow one verb to be the complement of another verb. This gives nominal morphology, in particular case morphology, a point of entry into the verbal system. Nouns fall into different inflection classes on the basis of case-marking morphology, as is shown in Sect. 2.3, and these find their way into the verbal system through constructions that use the gerund.

2.2 The shape of the verbal paradigm

As a necessary precursor to describing the morphological properties of the gerund we first sketch out the basic elements of the verbal paradigm. Nuer verbal morphology can be divided into two cross-cutting systems that we distinguish as inflectional and derivational. The inflectional paradigm consists of (i) finite forms, (ii) non-finite forms that are used with auxiliaries, and (iii) the gerund. The derivational paradigm distinguishes various types of valence alternations (both arguments and goals), as well as iteration.

An account of the verbal paradigm in turn presupposes an understanding of the system of morphological exponents, whose surface manifestation may seem opaque to those not familiar with the morphophonology of Western Nilotic languages. Morphological alternations in Nuer involve both suffixation and stem modification. While suffixation is straightforward, stem modification involves complex alternations of vowel and voice quality, length and tone, a full account of which warrants separate studies of their own (for example, see Reid 2017; Monich 2019). What is crucial for our purposes here is a system of two cross-cutting sets of alternations of the root vowel (verbal roots are invariably monosyllabic), which we distinguish as grade A~B and grade 1~2. Table 1 illustrates the basic principles, using the verbal root meaning ‘kick’. Within the verbal system, the grade A~B alternation characterizes inflectional values such as person/number, as shown here with the contrast between 3SG and 1SG subject forms. The grade 1~2 alternation characterizes derivational alternations, exemplified here by the contrast between the transitive paradigm and the corresponding antipassive, which is a derived intransitive.

Table 1 Vowel grade alternations in the verbal root ‘kick’

	Transitive (grade 1)	Antipassive (grade 2)
3SG (grade A)	kwěd-ê	kwèd-ê
1SG (grade B)	kwěad-ǎ	kwèd-ǎ

Table 2 Vowel grades

Grade 1		Grade 2	
Grade A	Grade B	Grade A	Grade B
ɪ	ɛ	ĩ	ie
ɛ	ɛa	ẽ	e
a	a	ʌ	ǎ
—	—	ɔ	ɔa
ɔ	ɔa	o	o
ʊ	ʊɔ	u	uɔ

Table 3 Inflectional and derivational paradigm for the verb ‘kick’

	TR		AP		APPL		CP		MUL (TR)
1SG	kwěad-ǎ	1B	kwèd-ǎ	2B	kwéd-ǎ	2B	kwèed-ǎ	2B	kwèd-ǎ
2SG	kwěd-ĩ	1A	kwèd-ĩ	2A	kwéd-ĩ	2A	kwèed-ĩ	2A	kwèd-ĩ
3SG	kwěd-ê	1A	kwèd-ê	2A	kwéd-ê	2A	kwèed-ê	2A	kwèd-ê
1INCL DU	kwěad-nè	1B	kwèd-nè	2B	kwéd-nè	2B	kwèed-nè	2B	kwèd-nè
1INCL PL	kwěad-nê	1B	kwèd-nê	2B	kwéd-nê	2B	kwèed-nê	2B	kwèd-nê
1PL	kwěat-kɔ	1B	kwèt-kɔ	2B	kwét-kɔ	2B	kwèet-kɔ	2B	kwèt-kɔ
2PL	kwěad-è	1B	kwèd-è	2B	kwéd-è	2B	kwèed-è	2B	kwèd-è
3PL	kwěat-kê	1B	kwèt-kê	2A	kwét-kê	2B	kwèet-kê	2B	kwèt-kê
BARE	kwèt	1A	kwèt	2A	kwét	2A	kwèet	2A	kwèt
NF	kwět	1A	kwét	1A	kwèt	2B	kwèet	2B	kwèt
NF NEG	kwèt	1A	kwèt	2A	kwét	2A	kwèet	2A	kwèt
IMP	kwět	1A	kwèd-nĩ	2A	kwéd-nĩ	2A	kwèed-nĩ	2A	kwèd-nĩ
GER (NOM SG)	kwèt	2B	kwèt	2B	kwèt	2A	kwèet	2A	kwéd-nĩ

Table 2 shows the complete vowel inventory of the language classified in terms of the grade alternations. The grade A~B alternation typically involves lowering (e.g. ʌ~ǎ), along with diphthongization for some vowels (e.g. ɪ~ɛ); high mid vowels however undergo a voice quality change from breathy to modal voice (ɛ~e and ɔ~o). Grade 1~2 typically involves raising, alongside voice quality change from modal to breathy voice. For the sake of clarity, in subsequent paradigmatic tables we include the information about the grade of the stem vowel next to the word form (e.g. kwěd-ê 1A).

Table 3 exemplifies verbal morphology, with the inflectional values as rows and a selection of the derivational paradigms as columns. We review here briefly the various

functions. Along the inflectional dimension, the subject-marked forms are used with the non-negated present tense, except when a nominal subject immediately follows the verb, in which case the BARE form is used. The NF form is the general form used with auxiliaries (e.g. for past and future), while the NF NEG is used just with the present negative auxiliary. Along the derivational dimension, the transitive (21) is arguably the basic form.⁴ Some of the derived paradigms involve valency changes, either reduction through the removal of the direct object (the antipassive in (22)), or increase through the addition of an argument (the applicative in (23)). The centripetal form signals a movement towards a reference point (24). (Not illustrated here are the valency-reducing paradigms that can be generated for the applicative and centripetal forms.) All of these categories can further derive multiplicative forms that signal that the action is performed multiple times or over a period of time, illustrated here with a multiplicative transitive (25).

- (21) c₁ r₂aan kw₂ët
AUX.PRF.1 SG person.NOM.SG kick.TR.NF
'I kicked the person.'
- (22) c₁ kw₂ët
AUX.PRF.1 SG kick.AP.NF
'I kicked.'
- (23) c₁ r₂aan kw₂ët Bôool
AUX.PRF.1 SG person.NOM.SG kick.APPL.NF B.NOM.SG
'I kicked Bool [personal name] for the person.'
- (24) c₁ r₂aan kw₂ët r₂êj
AUX.PRF.1 SG person.NOM.SG kick.CP.NF inside
'I kicked the person while (I was) going inside.'
- (25) c₁ r₂aan kw₂ët
AUX.PRF.1 SG person.NOM.SG kick.MUL.NF
'I kicked the person many times.'

Undersived paradigms, can have a grade 1 or grade 2 vowel, while the derived paradigms associated with argument alternations (antipassive and applicative) are restricted to grade 2.⁵ Inflectional paradigms involve an alternation between grade A~B as well as suffixation, both of which are largely identical across all derivational paradigms, with three systematic exceptions. First, the vowel of the 3PL intransitive verbs is grade A, while other verbs have grade B.⁶ Second, the vowel of the NF form

⁴The main argument is morphological predictability: the morphological characteristics of the stem are apparent in the transitive, but may be neutralized in the other paradigms. There is also a small class of what might be called 'middle' verbs whose basic form is intransitive, which we do not discuss here.

Note that many of the forms shown in are identical across different derivational paradigms, but there is always at least one form within the paradigm that distinguishes them.

⁵For some verbs, grade 1 vowels may be retained in the multiplicative and centripetal paradigms. In addition, undersived roots can have a grade 2 vowel, in which case all derived paradigms also have a grade 2 vowel.

⁶This applies to the undersived intransitive and derived antipassive.

varies considerably across different derivational paradigms.⁷ Third, the imperative is unsuffixed with underived transitives, but suffixed with all other paradigms.⁸

The gerund occupies an exceptional place within this paradigmatic matrix. First, gerunds always have a grade 2 vowel. This means that within an underived transitive paradigm, where all other forms can have a grade 1 vowel, the gerund stands out by virtue of its grade 2 vowel (see Table 3 and fn 8). Second, and more importantly in the present context, gerunds have not just the nominative form shown here, but a genitive and locative form too. This is where nominal inflection classes enter into the picture.

2.3 Nominal inflection classes and gerunds

Verbal inflection, though it appears complex, is nevertheless almost entirely regular. With the few exceptions noted in Sect. 2.3, all verbs display the same suffixes and the same pattern of vowel grade alternations. Noun inflection, by contrast, is characterized by lexical specification and irregularity in both suffixation and stem alternation. We cannot pretend here to do justice to its full extent, and limit ourselves to the points relevant to the discussion at hand. (For a more complete treatment of nominal inflection, see Baerman and Monich 2019.)

Nouns fall into a number of classes based on their inflection both in the singular and plural, but since gerunds do not have plural forms (with the exception of the multiplicative) it is enough to look just at the different patterns of singular inflection. As with underived verbs, the stem vowel may belong to grade 1 or grade 2; Table 4 shows the four major classes, using nouns with a grade 2 vowel. In the first two types ('forest' and 'path'), case inflection is realized by a vowel grade alternation between grade A and B. With both types the genitive has a grade B vowel and the locative a grade A, but they differ in the nominative: the first type has a grade A vowel and the second grade B.⁹ The third type ('goose') shows both a vowel grade alternation and a suffix, with grade B in the nominative and grade A, plus suffixation, in the genitive/locative. (The full form of the suffix is *-kA*, but the initial /k/ is only realized following a vowel.) The fourth type ('dove') has the same suffix, but has an invariant grade A root vowel.¹⁰

The class membership of a noun is not phonologically determined, nor is there any single form which would allow one to predict the entire paradigm. For example, if a noun has a grade A nominative, it could belong to either the first type or

⁷The applicative has grade B, underived transitives tend to have grade A; other categories show either grade, which may be subject to lexical specification (the data are so far unclear).

⁸Derived paradigms further differ in terms of the length of the stem vowel, with both vowel lengthening and vowel shortening attested. Within the inflectional paradigm, vowel length is fixed for all categories except the underived transitive and underived intransitive, where longer stem vowel can occur in present singular forms and, occasionally, the antipassive, where the NF stem can differ in vowel length from the rest of the forms. Tonal alternations occur as well.

⁹Most ordinary nouns in fact lack a distinct locative, and use the genitive case form in place of it. Those nouns that maintain a distinct locative on the whole refer, unsurprisingly, to locations or goals. Gerunds however reliably display distinct locatives, perhaps due to their use in verbal constructions that require it, as in (10) and (11).

¹⁰The length alternations for case apparent here and in other noun paradigms are largely predictable, but it would take us too far afield to describe them, and they are not crucial for the discussion at hand.

Table 6 Vowel grade of nominative singular gerund in relationship to the underived transitive verb stem

	Gerund		2SG		Verb stem qualities
‘miss’	ṭēm	2B	ṭīm-ī	1A	grade 1 (short)
‘remember’	ṭēem	2B	ṭīum-ī	1A	grade 1 (long)
‘graze’	p̣āt	2A	p̣ād-ī	2A	grade 2 (short)
‘write’	g̣āar	2B	g̣āar-ī	2A	grade 2 (long)

Table 7 Oblique inflection of the gerunds in Table 6

	short stem verbs				long stem verbs			
	‘miss’		‘graze’		‘remember’		‘write’	
NOM SG	ṭēm	2B	p̣āt	2A	ṭēem	2B	g̣āar	2B
GEN SG	ṭēm	2B	p̣āt	2B	ṭīim-ā	2A-ā	g̣āar-ā	2A-ā
LOC SG	ṭīm	2A	p̣āt	2A	ṭīim-ā	2A-ā	g̣āar-ā	2A-ā

illustrated in Table 6 for the gerunds of underived transitive verbs, taking the 2SG form as diagnostic of the underlying vowel and the length contrast.¹² If the verb has a grade 1 stem vowel, the nominative gerund has a grade B vowel, whether the stem is short or long. If the verb has a grade 2 stem vowel, the form of the gerund is sensitive to length. If the verb stem is short, the nominative gerund has a grade A vowel. If it is long, it has a grade B vowel. In all these cases the underlying stem length is also seen in the gerund.¹³

Oblique case morphology can then in principle follow either type (with or without suffixation), but there appear to be strong tendencies, again based on phonological properties of the verb stem (Table 7). If the verb has a short stem, it will typically be unsuffixed, while if it has a long stem, it will typically be suffixed.

There are two classes of exceptions. First, long stems that end in a glide (/j/ or /w/) shorten in the gerund. They still take the oblique case suffixes predicted by their underlying stem length, but the gerunds themselves are short (Table 8), so that the length of the nominative itself is not predictive, as was the case with verbs in Table 7.

Second, lexical exceptions to the usual association between stem length and oblique case suffixation are not infrequent (Table 9). Some short stem verbs also permit an alternative suffixed oblique form (‘sharpen’), while some long stem verbs take unsuffixed oblique case forms (‘drink’). That means that the inflection class distinctions in the gerund can still be lexically specified, even in the face of default tendencies.

¹²Long stems are in fact lengthened to overlong in the singular, but because of various other morphophonological processes that affect length, this remains one of the more reliable environments for observing length contrasts.

¹³Stems containing a glide in onset position, immediately following an initial consonant, form their gerunds as if they were short stems. Thus the long grade 2 stem verb *dwāAAC-i* ‘cane.2SG’ has the short grade A nominative gerund *dwāC* rather than the long grade B form **dwāac* expected of a long grade 2 stem.

Table 8 Shortening of the gerund in glide-final stems

	‘fish’ (2SG <i>māaaj-ḷ</i>)		‘Perform dance step’ (2SG <i>rāḷAAW-ḷ</i>)	
NOM SG	māḷj	2B	rāḷw	2B
GEN SG	māḷj-ḷ	2A-ḷ	rāḷw-ḷ	2A-ḷ
LOC SG	māḷj-ḷ	2A-ḷ	rāḷw-ḷ	2A-ḷ

Table 9 Exceptional oblique case inflection

	Short stem ‘sharpen’ (2SG <i>tēr-ḷ</i>)			Long stem ‘drink’ (2SG <i>māaad-ḷ</i>)		
NOM SG	tēr	2B		tēr	2B	māaat
GEN SG	tēr	2B	or	tēr-ḷ	2A-ḷ	māt
LOC SG	tēr	2A		tēr-ḷ	2A-ḷ	māt

Table 10 Gerunds from derived verbs

	‘cut’, applicative (2SG <i>tēm-ḷ</i>)		‘cut’, underived transitive (2SG <i>tēm-ḷ</i>)	
NOM SG	tēm	2A	tēm	2B
GEN SG	tēm-ḷ	2A-ḷ	tēm	2B
LOC SG	tēm-ḷ	2A-ḷ	tēm	2A

The four inflectional classes exist only for gerunds formed from underived verbs (transitive verbs in the vast majority of cases, though there are also a handful of underived intransitives). Gerunds of derived verbs display uniform behaviour across the lexicon. There are two types. The first, found with most derivational paradigms, is represented in Table 10 by a applicative verb: the gerund has oblique case suffixes and an invariant grade A stem.

The second is found with multiplicative verbs whose gerunds inflect as plural nouns, reflecting their inherent event plurality through explicitly nominal plural marking. As with the singular, plural case inflection in nouns falls into different classes, but only one of them is found with gerunds, namely a grade A stem vowel plus the suffix *-ni*, the same for all three cases, as in *kwèd-ni*, the gerund of the multiplicative of ‘kick’ in Table 3.

To conclude this section, we review the basis for the claim that verbs in Nuer incorporate nominal inflection class distinctions. It depends on the assumption that we can understand gerunds as part of the verbal paradigm and not just as deverbal nouns, at least when they used in the sorts of constructions illustrated in (4)–(20). It is admittedly difficult to find arguments one way or another. Thus in contrast to the Latin gerund ‘see’ in (26), which takes an accusative complement, they retain nominal properties of government, taking a genitive complement rather than the nominative complement that would otherwise be expected of verb.

- (26) cupid-us urb-em vidend-ī
 desirous-NOM.SG.M city-ACC.SG see.GER-GEN.SG
 ‘desirous of seeing the city’ (Bennet 1942:221, 223)

But it is hardly unreasonable to ascribe their various uses – for example, verb-verb complementation, progressive aspect, or purpose – to the sphere of activity of verbs. Were it not for their nominal morphology, one would hardly hesitate in identifying gerunds as part of the verbal paradigm. The other aspect of our claim is the identification of the different case inflection patterns as inflection classes, in the sense that there is lexical specification of inflectional morphology. To the best of our knowledge this must be true, for both ordinary nouns and for gerunds. Gerunds formed from underived verbs face a two-way lexical choice: while the nominative form is largely predictable from phonological properties of the stem, oblique case inflection can still follow either of two patterns. Although there are some tendencies based on stem phonology, there is still room for lexical specification, as illustrated in Table 9.

3 Irish

3.1 Old/Middle Irish

The closest parallel to the Nuer system that we are aware of is that of Old and Middle Irish (8th–12th centuries; McCone 2005:2), where verbal nouns play a prominent role in the verbal paradigm. McCone (2005:41) gives the following examples in each of the four cases (excluding the vocative); verbal nouns are glossed here as *-ing* forms:

- (27) Nominative
 ba bés dano dó do grés
 was.3SG custom.NOM.SG moreover to.him to continuance.DAT.SG
 a n-adall¹⁴ ocus a tadal
 of.them visiting.NOM.SG and of.them revisiting.NOM.SG
 ‘it was, moreover, his custom always to visit and revisit them’
- (28) Accusative
 dlig-id gó a cairigud
 deserve-3SG.PRS falsehood.NOM.SG the.ACC.SG rebuking.ACC.SG
 ‘falsehood should be rebuked’ (lit. ‘falsehood deserves the rebuking’)
- (29) Genitive
 láech a thairisme-a
 hero.NOM.SG of.him withstanding-GEN.SG
 ‘a hero capable of withstanding him’ (lit. ‘hero of withstanding of him’)
- (30) Dative
 biuu-sa oc airbaig
 am-EMPH.1SG at boasting.DAT.SG
 ‘I am (always) boasting’ (lit. ‘I am at boasting’)

The functions illustrated here are similar to those found with the Nuer gerund, e.g. as a verbal complement (28) or as a progressive based on a locative construction (30),

¹⁴The initial /n/ is assigned by the preceding 3PL genitive pronoun, as part of the well-known Irish morphophonological process of initial mutation.

Table 11 Exemplary paradigms of the classes represented in (31), per McCone (2005)

	I 'man'	II 'kingdom'	III 'shape'	IV 'prayer'	V dental 'unity'	V nasal 'opinion'
NOM SG	fer	tuath	cruth	guide	oíntu	toimtiu
ACC SG	fer	tuaithe	cruth	guidi	oíntaid	toimtin
GEN SG	fir	tuaithe	crotho	guide	oíntad	toimten
DAT SG	fiur	tuaithe	cruth	guidi	oíntaid	toimtin

and, as in Nuer, the verbal noun has nominal syntactic properties, taking genitive complements, as in (27) and (29). And crucially, they fall into different inflection classes. As a conservative Indo-European language, Old (and Middle) Irish retains a wealth of nominal inflection classes. Verbal nouns are not formed by any identifiable morphological operation, but rather are ordinary-looking nouns distributed across the different classes. Some examples of the progressive construction with the preposition *oc* (as employed in (30)) are given in (31), showing a variety of dative case forms according to the different inflection classes. Noun paradigms in the corresponding inflection classes in are shown in Table 11, using the exemplary paradigms given by McCone (2005).

(31)	<i>oc cíul</i>	'singing'	(eDIL)	class NOM SG <i>ceól</i> GEN SG <i>cíuil</i>
	<i>oc gabail</i>	'taking'	(McCone 2005:67)	class II NOM SG <i>gabail</i> GEN SG <i>gabala</i>
	<i>oca iarfaigid</i>	'asking'	(Ronan 2006:67)	class III NOM SG <i>iarfaigid</i> GEN SG <i>iarfaightho</i>
	<i>oc comguidi</i>	'praying together'	(Gagnepain 1963:49)	class IV NOM SG <i>comguide</i> GEN SG <i>comguide</i>
	<i>oc aentaid</i>	'uniting'	(Gagnepain 1963:141)	class V dental NOM SG <i>oéntu</i> ¹⁶ GEN SG <i>óentad</i>
	<i>oc tuistin</i>	'begetting'	(Gagnepain 1963:511)	class V nasal NOM SG <i>tuistiu</i> GEN SG <i>tuisten</i>

Note: nominative and genitive forms for illustration are taken from the *Dictionary of the Irish Language: Based Mainly on Old and Middle Irish Materials* (eDIL).

There is no straightforward relationship between the forms of the verbal noun and the rest of the verbal paradigm. McCone's extensive study of Old Irish verbs (1997)

¹⁶The eDIL gives the stem vowel as [oe, oi] rather than [æ].

Table 12 Manifestations of inflection class distinctions in verbal nouns (Carnie 2008)

	Class A no change 'dancing'	Class B palatalization 'looking'	Class D -o 'winning'	Class H -ach ~ -aigh 'searching'
NOM SG	damhsa	amharc	buachan	cuardach
GEN SG	damhsa	amhairc	buachana	cuardaigh

defers all discussion of verbal nouns to Thurneysen (1946), who observes that '[t]he formation of these verbal nouns is governed by no uniform rules' (p. 444), though there are certain subregularities. Thus weak verbs (characterized by a suffix *-a* or *-i* in the present stem), most of which are denominal, usually form their verbal noun with a dental suffix and inflect according to class III, for example NOM SG *mórad*, GEN SG *mórho* from *-mora* (3SG PRS CONJUNCT) 'magnify' (Thurneysen 1946:445, 459).¹⁷ Verbal nouns formed from strong verbs, whose present stem lacks a vocalic suffix, show a greater variety of stem formations, and hence, a greater range of inflection classes.

3.2 Neutralization of nominal inflection classes in the Modern Irish verb

Modern Irish retains a rich set of inflection class distinctions in its nouns, including verbal nouns, although case inflection has largely been reduced to the opposition of two forms: nominative vs. genitive (Carnie 2008, Chap. 5), as shown in Table 12. It also retains the use of verbal nouns in verbal constructions.

But verbal nouns show split patterns of inflection. The variety of genitive formations is retained only by verbal nouns in their purely nominal use. When used in verbal constructions, all verbal nouns show identical behaviour: they take a suffix whose allomorphs (*-ta*, *-te*, *-tha* or *-the*) are determined by stem phonology (Stenson 2008:203f).¹⁸ Compare (32), where the verbal noun based on 'do, make' is used as an ordinary noun, and inflects according to class A (no change between nominative and genitive singular), with (33), where the verbal noun has a verbal function in a purpose clause, and takes the genitive suffix *-ta*.¹⁹

- (32) cúrsa déanaimh bád
 course.NOM.SG doing.GEN.SG boat.GEN.PL
 'boat building course'
 (Silva Nurmio, p.c., drawn from the New Corpus for Ireland)

¹⁷Conjunct forms involve a distinct set of subject markers used with all prefixed verbs, with unprefixed verbs after certain particles and conjunctions, and, in the earliest period, in clause-final position (Thurneysen 1946:350f).

¹⁸Morphologically, these are taken from the paradigm of verbal adjectives.

¹⁹In practice, the genitive is only used when the verbal noun is (i) governed by a genitive-taking preposition, and (ii) governs a genitive pronominal complement. This is now more of a literary construction than a colloquially productive one (Silva Nurmio and Ruairí Ó hUiginn, personal communication).

- (33) chun a d(h)éanta
 for its doing.GEN.SG
 ‘in order to do it’

Crucially, the elimination of genitive allomorphy means that verbally-employed verbal nouns still have lexically specified morphology, but it is restricted to a single form. It is thus probably no longer correct to speak of inflection class distinctions, but rather of one-off morphological irregularity. Either way, the inflection class system has undergone simplification precisely in the context of the verbal paradigm, but not elsewhere.

4 Summary and discussion

The Nuer and Old Irish nominal paradigms provide a typologically unusual context for the exploration of inflection classes. Normally, inflection classes are understood as confined to the word class in which they are manifested, and this is understandable, since this is the only context in which they are relevant. But nominal inflection classes in these languages lead a double life: as a property of nouns, and as a component of verbal paradigms.

The diachronic development of the Irish forms demonstrates that this dual affiliation may have real consequences. In Old Irish, it made no difference whether a verbal noun was used as an independent noun or as a component of a verbal construction: case morphology and inflection classes were the same in both contexts. By the Modern Irish period the two had split, due to changes in the form of the genitive (in effect the only remaining distinct case form outside of the nominative). In their guise as independent nouns, verbal nouns retain reflexes of the original genitive and hence retain inflection class distinctions to the full extent possible. But where they participate in verbal constructions, an innovative genitive form is used, one which is morphologically identical across the lexicon. That means that although verbally-employed nouns retain inflection (nominative and genitive) and still require lexical specification (because the nominative form is not predictable from the rest of the paradigm), the role of inflection classes has been reduced or eliminated, because there is only a single form that shows any variation across the lexicon. This shows that membership in the verbal paradigm does have concrete consequences for nominal morphology.²⁰

It is not self-evident that this should be so. Stump (2016) characterizes a similar configuration as *metaconjugation*, which refers to a set of morphological forms that occur in different paradigmatic contexts with different lexemes. Stump illustrates this with an example from Sanskrit, where the stem formative morphology used for

²⁰The effects of word class membership on paradigms are well known, but the examples we know of involve allomorph selection, which is a different issue. For example, in Russian, possessive adjectives form the basis of many surnames. Possessive adjectives normally have case-number endings distinct from what is found with nouns, but these substantivized possessive adjectives have adopted some of the corresponding noun endings (see Spencer 2002:284). The Irish case does not involve the transfer of allomorphs from one word class to another, because the feature set is completely different. Rather, what changes is the paradigmatic context that case marking is embedded in.

Table 13 Metaconjugation in Sanskrit (Stump 2016:216)

	‘strike’	‘be happy’
3SG IPRF	a-tud-a-t	a-tuṣ-ya-t
3SG AOR	a-taut-s-īt	a-tuṣ-a-t

the present system (present and imperfect indicative, optative, and imperative sub-paradigms) for some verbs is used for the aorist system (aorist indicative and precative subparadigms) for others. For example, a stem formed from suffixation of *-a* is used for the imperfect indicative (present system) with ‘strike’, but for the aorist indicative (aorist system) with ‘be happy’ (Table 13). But Stump does not suggest that we should expect the two instantiations of this stem-formative class to deviate from each other as a consequence of this split, as has happened with the two instantiations of case inflection (nominal and verbal) in Irish.

The closest parallel we are aware of to the Irish developments occurs when an inflected form becomes lexicalized and consequently immune to later changes that affect the source paradigm. For example, the adjective *molten* was derived from a now-obsolete strong participial form of *melt* which has since been replaced by the productive weak form *molten*. The change there is understandable, because only the properly verbal form was subject to the paradigmatic pressure to replace its irregular morphology, while the isolated adjective was not. But the Irish example is different, in that *both* contexts involve inflected words, and it is not clear what paradigmatic pressures would have affected the genitive of verbal nouns in their verbal use that would not also have affected them in their function as independent nouns. Frequency may have played a role, in that the verbal construction which employs the genitive of a verbal noun is not common, perhaps making it prone to levelling across the lexicon. But lacking more detail about the historical developments, we do not wish to over-interpret these observations, and so leave these as open questions. The key point is that what had once been an independent and morphologically heterogeneous set of nouns has undergone innovations in its case inflection as a consequence of its association with the verbal paradigm.

Nothing of the sort is seen in Nuer, gerunds inflect in the same way as other nouns. We can draw no conclusions from that; first because we would claim no inevitability to the developments seen in Irish, and second, because we have no idea how long this state of affairs has existed in Nuer. (Comparable verbal uses of deverbal nouns have not been described for Dinka or Reel, the languages most closely related to Nuer.) But the systematic relationship of gerund inflection to the rest of the verbal paradigm does provide a unique perspective on the nature of inflection class membership. With ordinary nouns there is not much we can say. While there are default tendencies, these can be overridden, so that the lexical entry for any noun would need to list two principal parts, as suggested in Sect. 2.3. But gerunds slot into the paradigm of the verb in a way that allows us to see inflection class membership in terms of layers of morphological predictability, summarized in Table 14. First, there is a split between underived (typically the underived transitive) and derived verbs (such as applicatives). Gerunds of derived verbs all inflect according to the same pattern, while those of underived verbs are subject to further conditions. Two phonological properties of the

Table 14 Breakdown of gerund form assignment in Nuer

a. <i>Derivational status of verb</i>		Derived		Underived
		NOM SG	2A	
	GEN SG	2A- ḡ	<i>see below</i>	
	LOC SG	2A- ḡ		
<i>System for underived verbs</i>		Short stem		Long stem
		grade 1	grade 2	
b. <i>Nominative determined by verb stem phonology</i>	NOM SG	2B	2A	2B
c. <i>Default oblique determined by verb stem phonology</i>	GEN SG	2B	2B	2A- ḡ
	LOC SG	2A	2A	2A- ḡ
d. <i>Lexical specification of oblique</i>	GEN SG	2A- ḡ	2A- ḡ	2B
	LOC SG	2A- ḡ	2A- ḡ	2A

verb stem (length and vowel grade) unambiguously determine the form of the nominative. Verb stem length alone then determines typical oblique case inflection; recall that in the case of glide final stems, this length is covert in the gerund itself, because the underlying length distinctions have been neutralized. Finally, lexical specification can override this default assignment of oblique case forms.

Thus while inflection class assignment in the ordinary noun system is something of a black box, with gerunds there is a morphological and phonological story behind much of this otherwise covert process. This observation can supplement recent studies where inflectional classes are evaluated on the basis of *internal* measures of predictability such as inflection class transparency (and Stump and Finkel 2013) or paradigm entropy (Ackerman and Malouf 2013). If we isolate the gerund from the rest of the verbal paradigm then these measures will give results similar to those found for ordinary nouns. But if we step back and look at it in relationship to the rest of the verbal paradigm, a different picture will emerge, because the forms are also predicted, wholly or partly, directly from the verbal paradigm. One concrete effect of this difference might be manifested in diachronic change. Thus Nuer might follow the path of Irish and increase predictability of gerund inflection precisely in verbal contexts. One place to look for this might be with glide-final long stems (Table 8), where vowel shortening in the gerund has obscured the transparency of the relationship of inflection to the verb stem. Will predictability ever be restored? We cannot answer this now, of course, but there remain many undescribed dialects of Nuer, so perhaps further work might uncover telling variation in the system.

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