

Iterated D-layers and Multiple Case Exponence: The structure and significance of a morphological *rarissimum*

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The paper addresses a typologically unusual instance of Multiple Exponence – some *wh*-based items in Digor Ossetic, an agglutinative Eastern Iranian language spoken in the Caucasus, exhibit double case marking in the plural. For example, the allative plural of the indefinite *ka-der* who-INDEFINITE ‘someone’ is *ke-me-der-te-me* who-ALLATIVE-INDEFINITE-PLURAL-ALLATIVE. I propose an analysis of this phenomenon in the framework of Distributed Morphology. The key ingredients of the analysis are the presence of two D heads on the spine of such a nominal; and the possibility of last-resort sharing of a case value between these heads. Furthermore, under appropriate conditions, the case exponents associated with the two D heads undergo haplological dissimilation. The rarity of this kind of double case exponence is due to the fact that a number of independent conditions need to be met simultaneously in order for it to obtain.

Keywords: Case marking; Number marking; Multiple exponence; Distributed Morphology; Morphological haplology; Digor Ossetic.

1 Introduction

Multiple Exponence (ME), in the explicit definition of Harris (2017: 9) is “the occurrence of multiple realizations of a single morphosemantic feature, bundle of features, or derivational category within a word”. Assembling an extensive array of case studies, Harris (2017) showed the phenomenon to be fairly common cross-linguistically. As the examples in (1) illustrate, a wide variety of features can be multiply expounded.

- (1) a. ME of gender concord, Karata (Northeast Caucasian; Russia)
b-eč’et’iro-b riha
B-black-B goat(B).ABS¹
‘black goat’ (Magomedbekova 1971: 85)
- b. ME of φ -feature agreement, Ibibio (Cross-River; Niger-Congo; Nigeria)
ɔmmɔ **e-ya-e-dep** ebot
they **3PL.SG-FUT1-3PL.SG-buy** goat
‘They will buy a goat.’ (Baker & Willie 2010: 101)
- c. ME of pluractionality marking, Lower Bal Svan (South Caucasian; Georgia)
dina išg-**al-æ**-i pur-ær-s
girl.ABS milk-**PLL-PLL-PRS** cow-PL-DAT
‘The girl milks cows.’ (Harris 2017:63)
- d. ME of causative marking, Lusoga (Bantu; Uganda)
bà-kùb-**ír-ágán-ír-á**
3PL-beat-CAUS-REC-CAUS-FV
‘they beat each other’ (Caballero & Inkelas 2018: 132)

¹ The paper uses the following glosses and abbreviations: ABL ablative; ABS absolutive; ADV adverbial; ALL allative; B B-gender (in Northeast Caucasian languages); CAUS causative; COM comitative; COR correlative; DAT dative; EMP scalar particle; EQU equative; ERG ergative; FUT future; FV final vowel; GEN genitive; IDF indefinite; INS instrumental; LOC locative; NMZ nominalizer; NOM nominative; M a suffix in dative, ablative, and inessive *wh*-words in Ossetic; OBL oblique; PART partitive; PLL pluractionality; PRS present; PV preverb; REC reciprocal; SBJV subjunctive; SUBJ subject marker; SUP superessive; TR transitivizer; v verbalizer; DM Distributed Morphology; VI Vocabulary Item.

ME does not constitute a uniform phenomenon. To address different instances of ME, several different mechanisms have been proposed in the Distributed Morphology literature so far. Some ME phenomena have been shown to be derived by idiosyncratic, but well-motivated postsyntactic operations: Fission (Noyer 1997; Arregi & Nevins 2012; McGinnis-Archibald 2016); phonological reduplication of the relevant exponents, (Harris & Halle 2005; Arregi & Nevins 2012; Deal 2016), and “enrichment,” which essentially is a reduplication of morphological features, Müller (2007). On the other hand, some ME phenomena have been shown to arise still in the narrow syntax and to be a manifestation of a more involved syntactic structure, but not to require any non-standard syntactic operations (Baker & Willie 2010; Oxford 2017).

In this paper, I address an apparently typologically rare phenomenon, multiple case exponence in the plural forms of *wh*-words and *wh*-based indefinites in Digor Ossetic, an endangered minority East Iranian language spoken in the North Caucasus. The pattern of case marking in such items is illustrated in (2) with a partial paradigm of the *wh*-word *ka* ‘who’ and the indefinite *ka-der* *who-IDF* ‘someone’. In all the cases with non-null exponents, i.e., all the cases other than the nominative, case marking appears twice: after the *wh*-stem and after the plural marker.

(2)	Nominative	ka-tɛ who-PL 'who.PL'	ka-der-tɛ who-IDF-PL 'someone.PL'
	Non-nominative cases		
		wh-CASE-PL-OBL	wh-CASE-IDF-PL-CASE/-PL-OBL
	Dative	kɛm-ɛn-t-i who-DAT-PL-OBL	kɛm-ɛn-der-t-ɛn/t-i who-DAT-IDF-PL-DAT/-PL-OBL
	Allative	kɛ-mɛ-t-i who-ALL-PL-OBL	kɛ-mɛ-der-tɛ-mɛ/-t-i who-ALL-IDF-PL-ALL/-PL-OBL

I will argue that this instance of ME arises due to a combination of a rather idiosyncratic internal syntax of these items and a postsyntactic operation motivated by haplology avoidance. More specifically, I propose that such plural indefinites involve two D heads, each of which receives the case feature. The higher D head receives the feature by the regular case-assignment mechanism, while the lower one receives the same feature from the higher by a dedicated last-resort feature-sharing mechanism. A similar feature-sharing procedure was proposed in Clem & Dawson (2021: 13) for multiple occurrences of D in nominals in Tiwa (Tibeto-Burman²). I provide additional language-specific evidence for the existence of this mechanism in Digor Ossetic and propose a locality condition for it. At the spellout, a haplology-resolving operation takes place under certain conditions in Digor, which results in the spellout of non-identical case markers.

This paper is organized as follows. In Section 2, I introduce the empirical puzzle this paper deals with, double case exponence in certain *wh*-based plurals. In Section 3, I show that postsyntactic operations proposed in the DM literature to account for Multiple Exponence cannot account for the phenomenon under discussion. Section 4 provides the necessary background on Digor Ossetic case and number morphology, and on the structure of *wh*-based indefinites in this language. Section 5 systematically addresses case and number marking in *wh*-based items. Section 6 treats the syntax of DPs in Digor in general, and the internal structure of *wh*-items of different types, *wh*-based indefinites, and of their plural forms. It introduces the first crucial ingredient of the analysis – the distinction between nP-sized and DP-sized *wh*-words, and the presence of two copies of D in the plural forms of the latter. Section 7 uses the syntax developed in Section 6 to show that narrow syntax-based proposals advanced for other instances of ME by

² In the published version, it is erroneously stated that Clem & Dawson’s work was on a different language, Tiwa (Tanoan). I thank Emily Clem for pointing this out to me.

Baker & Willie (2010) and Oxford (2017) cannot be generalized to our situation. Section 8 deals with case assignment in nominals involving two D heads. It introduces the second crucial technical ingredient of the analysis – the operation of last-resort feature transmission. Section 9 addresses haplological dissimilation of case exponents. Section 10 discusses possible reasons for the cross-linguistic rarity of the Ossetic-type double case marking pattern.

Unless explicitly indicated otherwise, all examples in this paper are from Digor Ossetic. Unattributed examples all come from my fieldwork materials.

2 The Puzzle

The phenomenon to be addressed in this paper is a typologically unusual pattern of multiple case exponence in the plural forms of some *wh*-words and *wh*-based indefinites in Ossetic. This phenomenon has not been previously addressed in the theoretical literature. In more traditional literature, Zgusta (1965) discussed the data and noticed their typological uncommonness³.

Ossetic builds indefinites on the basis of *wh*-stems, which by itself is common cross-linguistically, see Haspelmath (1997) for a typological overview, and specifically Haspelmath (1997: 281) for an inventory of indefinites in Iron Ossetic and an overview of their functions. I will call the series of indefinites of interest to us the *jes*-series and *der*-series, respectively.

The case marking in these indefinites is borne by the *wh*-stem, as illustrated by the partial paradigms of ‘who’-based indefinites in (3). For background information on Ossetic case morphology and complete paradigms, see Section 4 below.

(3)	<i>wh</i>	<i>jes</i> -series	<i>der</i> -series
		IDF- <i>wh</i>	<i>wh</i> -IDF
	Nominative	ka jef ⁴ -ke	ka- <i>der</i>
	Oblique	ke jef-ke	ke- <i>der</i>
	Allative	kə-mə jes-kə-mə	kə-mə- <i>der</i>
		‘who’ ‘somebody’	‘somebody’

Furthermore, *wh*-words and indefinites of *jes*- and *der*-series allow plural marking (4). For *wh*-words, this fact by itself is not typologically unusual, at least not for the region where the Ossetic languages are spoken, see e.g. Kornfilt (1997: 316–317) for plural-marked *wh*-words in Turkish (Turkic, Turkey); Tschenkéli (1958: 196) for Georgian (South Caucasian; Georgia); Dum-Tragut (2009: 148) for Standard Eastern Armenian (Indo-European; Armenia); and Bagirokova et al. (2022: 289) for Adyghe (Northwest Caucasian; Russia).

(4)	<i>wh</i>	<i>jes</i> -series	<i>der</i> -series
	<i>wh</i> -PL	IDF- <i>wh</i> -PL	<i>wh</i> -IDF-PL
	ka-tə	jef-ke-tə	ka- <i>der</i> -tə
	who-PL	IDF-who-PL	who-IDF-PL
	tʃi-tə	jef-ti-tə ⁵	tʃi- <i>der</i> -tə
	what-PL	IDF-what-PL	what-IDF-PL

³ I thank Ronald Kim for this reference.

⁴ In the dialect of Digor Ossetic represented here (spoken by the majority of Digor speakers, except the inhabitants of the town of Digora), sibilants and affricates palatalize when they, or the consonant clusters they are a part of, are followed by a front vowel. Accordingly, in such situations the prefix *jes*- takes the form [jɛʃ]. In the nominative form here, the root is irregular – it is *ke* instead of the expected *ka* (which would have produced the indefinite **jes-ka*).

⁵ In the *jes*-series indefinites based on *tʃi* ‘what’, the initial affricate of the root is dissimilated from the sibilant of the prefix to produce /t/.

While the singular forms are in principle number-neutral, the plural forms can be used when some kind of a plurality presupposition is involved (5).

- (5) a. **tsard-i medeɣe** **berɛ** **tʃi-der-te** **jes**
 life-OBL inside many what-IDF-PL exists
 ‘There are many different things in life.’ (from a recorded narrative)
- b. **zɛɣ-ɛ=nin** **de=mbel-tte** **ka-te** (ɛ)ntɕɛ **woj**
 say-IMP.2SG=DAT.1PL 2SG=friend-PL wh-PL be.PRS.3PL COR.OBL
 ‘Tell us who your friends are.’ Maliti (1995: 216)

Unexpectedly, in all the cases other than the nominative, the plural forms of these indefinites carry two overt case markers. One of them is the ‘actual’ case exponent on the *wh*-stem, and the other follows the plural marker, as is illustrated in (6) by a partial paradigm of ‘who’-based indefinites. For the plural forms of *wh*-words and *jes*-series indefinites, the outer case suffix is always the oblique case marker *-i*, (6 a–c). On the other hand, for the plural forms of the *der*-series it can be either the OBL marker *-i* or a second instance of the actual case marker (6 d–f).

- | | | | |
|--------|---|----|---|
| (6) a. | ke-t-i
who.OBL-PL-OBL
‘who.PL.OBL’ | d. | ke-der-t-i
who.OBL-IDF-PL-OBL
‘someone.PL.OBL’ |
| b. | ke-me-t-i
who-ALL-PL-OBL
‘who.PL.ALL’ | e. | ke-me-der-te-me/-t-i
who-ALL-IDF-PL-ALL/-PL-OBL
‘someone.PL.ALL’ |
| c. | ke-bel-t-i
who-SUP-PL-OBL
‘who.PL.SUP’ | f. | ke-bel-der-te-bel/-i
who-M-SUP-IDF-PL-SUP/-OBL
‘someone.PL.DAT’ |

The sentential examples in (7) below illustrate the use of these items.

- (7) Plural *wh*-words
- a. **kem-ɛj-t-i** **ra-kordzɛnɛ** **ɛxtsa?**
 who-ABL-PL-OBL PV-ask.FUT.2SG money
 ‘Who will you borrow money from?’
- b. **tsɛ-bel-t-i** **ɣudi** **kɛni?**
 what-SUP-PL-OBL thought do.PRS.2SG
 ‘What are you thinking about?’
- Plural *jes*-indefinites
- c. **jes-kem-en-t-i** **ɛnχusʁon=der=ma** **ɛntɕɛ**
 IDF-who-DAT-PL-OBL helpful=EMP=more be.PRS.3PL
 ‘To some, they are even helpful.’ Sk’odtati (2012: 237)
- Plural *der*-indefinites
- d. **samel** **tsɛ-bel-der-t-i** **fɛ-ssabɛs-tɛ** **kodta**
 Samel what-SUP-IDF-PL-OBL PV-thought-PL do.PST.3SG
 ‘Samel thought about something.’ Maliti (2006: 77)
- e. **ke-me-der-te-me/ke-me-der-t-i** **ɛnɛlmɛ** **kɛsun**
 who-ALL-IDF-PL-ALL /who-ALL-IDF-PL-OBL waiting look.PRS.1SG
 ‘I am waiting for somebody.’

It goes without saying that in the plural forms of lexical DPs, case is only marked once. Furthermore, no overt concord in case or number exists in Ossetic DPs (8b–d).

- | | | | | |
|-----|----|--|----|--|
| (8) | a. | atʃi ustur tikis
this big cat.NOM
'this big cat' | b. | atʃi ustur(*-mɛ) tikis-mɛ
this big-(ALL) cat-ALL
'to this big cat' |
| | c. | atʃi ustur tikis-tɛ
this big cat-PL
'these big cats' | d. | atʃi ustur(*-mɛ) tikis-tɛ-mɛ
this big cat-PL-ALL
'to these big cats' |

It is worth stressing that although the items in (6) and (7) bear two different case markers, that of the respective morphological case X and the oblique *-i*, the item as a whole only bears a single case normally expressed by X. This is illustrated by the minimal pair in (9), of which the sentence in (9a) repeats (7d). The lexical DP in (9b) only bears the superessive case marker *-bel*.

- | | | |
|-----|----|--|
| (9) | a. | samel tse-bel-der-t-i fe-ssaʁes-tɛ kodta
Samel what-SUP-IDF-PL-OBL PV-thought-PL did
'Samel thought about something.' |
| | b. | samel e=dzubandi-tɛ-bel fe-ssaʁes-tɛ kodta
Samel 3SG=speech-PL-SUP PV-thought-PL did
'Samel thought about her/his words.' |

Therefore, what we are dealing here with is indeed an instance of multiple case exponence in the sense of Harris (2017: 9), and not *Suffixaufnahme* in the sense of Plank (1995). i.e., not the marking of a nominal with several case markers coming from several case assigners. For instance, in the Old Georgian example in (10), the noun *iak'ob* Jacob bears the genitive as the possessor of *saxl* 'house', and the ergative that is assigned to the entire DP 'Jacob's house', possibly copied to the possessor by a case concord mechanism.

- | | |
|------|---|
| (10) | Old Georgian Shanidze (1976: 50) |
| | saxl-man iak'ob-is-man
house-ERG Jacob-GEN-ERG
'Jacob's house (erg.)' |

To account for the pattern in (6), I will argue that the structure of the respective plural-marked *wh*-words and *wh*-based indefinites involves two D heads, each of which is assigned case. The case value is shared between them, similarly to the proposal of Clem & Dawson (2021) for Tiwa. To express the case, each of the D heads projects an Agr head of its own. If those latter heads are close enough to each other, their features undergo dissimilation to avoid haplology, Nevins (2012).

3 Against Post-Syntactic Derivation of ME in Ossetic

In this section, I show that post-syntactic operations proposed in the literature to derive various manifestations of ME, cannot explain the Ossetic facts under discussion no matter what the syntax of the items involved. Specifically, I address fission, phonological reduplication, and enrichment.

3.1 Fission

In the standard toolbox of Distributed Morphology, the default way to address (ostensible) Multiple Exponence of a feature bundle is to make recourse to the operation of fission, see e.g.

Noyer (1997); Halle (1997); Arregi & Nevins (2012: 9); McGinnis-Archibald (2016: 406). The operation of fission was designed to handle situations where a feature bundle splits, as schematized in (11), and features are expressed one by one, so that that the new nodes carry differing (sets of) features.

(11) $[\alpha, \beta] \rightarrow [\alpha] [\beta]$

Given that for the *der*-series indefinites, two identical copies of the same case exponent may appear, as is illustrated by the partial paradigm in (12), it is hard to assume that what we are dealing with here is the splitting of whatever feature bundles that stand behind the case markers in Ossetic⁶.

(12) Dative *kəm-en-dər-t-en/t-i*
 Allative *kə-me-dər-tə-me/t-i*

Even if the appearance of the oblique marker *-i* alongside the dative marker could be explained by fission, the presence of two copies of the same case marker cannot.

3.2 Phonological reduplication

A phonological reduplication account of ME was proposed by Harris & Halle (2005: 201) for plural marking in Spanish verb-clitic combinations⁷. It has been applied to a variety of morphological phenomena in Arregi & Nevins (2012: 240). Another variation of this technique was applied by Deal (2016: 330–336) to analyze plural exponence in Nez Perce.

(13) Spanish Harris & Halle (2005: 195–196); Alcázar & Saltarelli (2010: 2)
vénda-n=lo vs. *vénda-n=lo-n* or *vénda=lo-n*
 sell.SBJV-3PL=it sell.SBJV-3PL=it-3PL sell.SBJV=it-3PL
 ‘You (pl) sell it!’

This type of analysis is not directly applicable to our data – first, it is not clear how a purely phonological account would treat the emergence of the oblique case marker instead of the exponent of the case the nominal stands in. Instead of the actual forms *ke-me-t-i* who-ALL-PL-OBL, *ke-bel-t-i* who-SUP-PL-OBL, etc. this account would predict the ungrammatical **ke-me-te-me* who-ALL-PL-ALL, **ke-bel-te-bel* who-SUP-PL-SUP, etc. Second, even if this dissimilation can somehow be accounted for, it is unclear what would prevent the same reduplication from occurring in lexical nouns resulting in ungrammatical forms such as the would-be allative plural of *bex* ‘horse’ **bex-me-t-i/t-en* horse-ALL-PL-OBL/PL-ALL, instead of the actual *bex-te-me* horse-PL-ALL.

3.3 Enrichment

To account for certain instances of Multiple Exponence, Müller (2007) proposed the operation of *enrichment*. Essentially, under enrichment, a feature that is to be expressed twice is reduplicated and participates twice in the spellout, Müller (2007: 261). However, by design, the enrichment

⁶ For the featural representation of the case exponents, see Section 9 below. For the current argument, the precise content of this feature bundle is not important.

⁷ Kayne (2010) and Alcázar & Saltarelli (2010) propose an alternative account of the Spanish data. Essentially, they argue for the existence of null auxiliaries whose agreement marker is the “reduplicated” plural marker. The phenomenon is then reduced to multiple agreement.

operation creates portmanteau morphemes – the reduplicated feature is expressed together with the feature that serves as the condition for reduplication (see the examples on pp. 261–264 of Müller’s work), whereas the feature expression in Ossetic plural indefinites is strictly separative – clearly distinguishable morphs express case and number. Furthermore, similarly to analyses in the style of Harris & Halle (2005), it is not clear how to ensure that such enrichment will only occur in *wh*-based items, and fail to do so in lexical nouns.

To recapitulate, standard postsyntactic operations argued to derive Multiple Exponence within the Distributed Morphology framework cannot directly account for the pattern under discussion. That might imply of course that another, yet unobserved post-syntactic operation is implicated here. However, the most theoretically parsimonious conclusion is to seek the reasons for the Ossetic phenomenon in the narrow syntax.

4 Background on Digor Ossetic morphology

Digor and Iron Ossetic are closely related East Iranian languages spoken in the Central Caucasus. They are often called dialects of the same language in the literature. The data in this paper is from Digor, however, a similar phenomenon exists in Iron, and the analysis proposed here is applicable to the Iron facts as well.

4.1 Basics of case and number morphology

Digor morphology is largely agglutinative. Case and number are marked by separate morphemes. In the lexemes relevant for the current discussion, the singular lacks an overt marker. The plural morpheme is *-(t)te-*. The basic allomorphs of the case markers in Digor are shown in Table 1 below.

Table 1: The basic allomorphs of case markers.

Nominative	-∅
Oblique ⁸	- <i>i</i>
Dative	- <i>en</i>
Ablative	- <i>ej</i>
Allative	- <i>me</i>
Superessive	- <i>bel</i>
Equative	- <i>aw</i>

For the sake of reference, I provide in Table 2 the case paradigms of lexical nouns. The data in the table show that the case markers mildly depend on whether what they attach to ends in a consonant, the vowel *-e*, or any other vowel. Before vowel-initial case markers, the stem-final *e* disappears. Accordingly, the plural marker *-te-* surfaces as *-t-* before such case markers. On the other hand, on the juncture of any other stem-final vowel and a vowel-initial suffix, the epenthetic glide *-j-* is inserted, as illustrated by the paradigm of *k’ere* ‘pie’ in Table 2.

⁸ I use the label “oblique” for the accusative, genitive, and inessive, which are syncretic for all lexical nouns. Whenever these cases are not syncretic, I will treat them separately.

Table 2. Case marking in Digor lexical nouns.

	Consonant-final singulars	Non e-final singulars	e-final	
			Plurals	Singular ⁹
Nominative	<i>bex</i> ‘horse’	<i>k’ere</i> ‘pie’	<i>bex-te</i> ‘horse’	<i>tun-e</i> ‘ray’
Oblique	<i>bex-i</i>	<i>k’ere-j</i>	<i>bex-t-i</i>	<i>tun-i</i>
Dative	<i>bex-en</i>	<i>k’ere-j-en</i>	<i>bex-t-en</i>	<i>tun-en</i>
Ablative	<i>bex-ej</i>	<i>k’ere-j-ej</i>	<i>bex-t-ej</i>	<i>tun-ej</i>
Allative	<i>bex-me</i>	<i>kere-me</i>	<i>bex-te-me</i>	<i>tun-e-me</i>
Superessive	<i>bex-bel</i>	<i>k’ere-bel</i>	<i>bex-te-bel</i>	<i>tun-e-bel</i>
Equative	<i>bex-aw</i>	<i>k’ere-j-aw</i>	<i>bex-t-aw</i>	<i>tun-aw</i>

The case and number morphology of lexical nouns will serve us as a baseline in further discussions of the properties of wh-based items.

4.2 Wh-words and wh-based indefinites

To repeat, indefinites in Digor Ossetic are based on wh-stems. They form a number of series, see a description and a discussion of the meanings of cognate indefinites in Iron Ossetic in Haspelmath (1997: 281). The whole inventory of series is illustrated for several wh-words in (14).

(14)		‘who’	‘what’	‘when’	‘what kind of’
	bare wh	ka	tʃi	ked	ketʃi
	<i>jes</i> -series	jef-ke	jef-ti	jes-ked	jes-ketʃi
	<i>-der</i> -series	ka-der	tʃi-der	ked-der	ketʃi-der
	<i>-deritter</i> -series	ka-deritter	tʃi-deritter	ked-deritter	ketʃi-deritter
	<i>-fendi</i> -series	ka-fendi	tʃi-fendi	ked-fendi	ketʃi-fendi

I exclude from further consideration indefinites that have full case paradigms but lack plural forms. These comprise the entire *deritter* and *fendi*-series for all wh-stems, as well as the indefinites of all the series based on the wh-word *tsal* ‘how many/much.’

Haspelmath (1997: 281) describes the uses of the two series under discussion in Iron Ossetic in the following manner: the *der*-series is only used in specific functions, while the *jes*-series is used in non-specific functions¹⁰, questions, irrealis contexts, conditionals, and in indirect negation contexts. Some of these uses are illustrated for Digor Ossetic in (15).

(15)	a.	<i>der</i> -series, a specific unknown context				
		soslan tʃi-der/*jef-ti	ba-χ ^w ardta	fal	ne=zonun	tʃi
		Soslan what-IDF/*IDF-what	PV-eat.PST.3SG	but	NEG=I	what
		‘Soslan ate something, but I do not know what.’				

⁹ In e-final singular nouns, -e is the singular number exponent, Erschler (2022: 264). In the remaining nouns, the null allomorph of the SG morpheme occurs.

¹⁰ Such examples as in (7c) above show that these indefinites do not directly map onto the English *some*- and *any*- indefinite series.

- b. *jes*-series, a non-specific context
- | | | | | |
|---------|---------------|------------|---------|--------|
| dew-me | jef-ti | un-i | bef-ti | men-me |
| you-ALL | IDF-what | be.INF-OBL | instead | I-ALL |
- wa
be.SBJV.FUT.3SG
'Instead of anything being yours, let it better be mine.' (from a recorded narrative)
- c. *jes*-series, a (rhetorical) question
- | | | | |
|----------------------|----------------|---------------|------------------|
| χ ^w ezder | tsard-me | enxelme | kesem |
| better | life-ALL | waiting | look.PRS.1PL |
| fal=neme | jes-ked | jef-ti | ra-wadex? |
| but=1PL.ALL | IDF-when | IDF-what | PV-issue.PST.3SG |
- 'We wait for a better life, but have we ever gotten anything?'
(from a recorded narrative)

Detailed semantics of these indefinites awaits systematic study. Nothing in the account proposed in this paper crucially hinges on it.

5 Case marking of wh-words, wh-based indefinites, and their plural forms

In this section, I systematically lay out the morphological facts to be accounted for in this paper. Digor wh-words and indefinites derived from them divide into two classes: those that exhibit the double case marking sketched in Section 2, and those that behave like lexical nouns, i.e., ones that expone the case only once.

5.1 Items that exhibit double case-marking in the plural

Only two wh-words exhibit a full case paradigm and double case marking in the plural: *ka* 'who' and *tfi* 'what'. The same is true for the indefinites derived from these wh-words. However, as we will see at the end of this section, a handful of items with very incomplete case paradigms (mostly wh-words) also exhibit this property.

The paradigms¹¹ of 'who' and 'what' are given in Table 3. The internal structure of these word forms is worth commenting upon. Except for the nominative forms *ka* 'who' and *tfi* 'what' and the oblique form *ke* of 'who', the case forms of the wh-words are built upon the stems that I gloss as non-nominative: *ke* for 'who' and *te* for 'what'. In addition, in the dative, ablative, and inessive case, the suffix *-m-* is attached to the non-nominative stem. The correct synchronic analysis of this suffix is at present unclear¹², and I agnostically gloss it M in this paper.

As the data in Table 3 show, the plural forms of these wh-words exhibit double case exponence. The plural suffix *-te-* is attached, as it were, to case-marked stems, and the oblique case marker is attached to it in all cases except the nominative.

¹¹ In these paradigms, I exclude the equative from consideration for the following reasons. Speakers have difficulty producing equative case forms of the items under discussion, and the forms offered show considerable variation. None of them have been found in the published texts in Digor I have at my disposal. Some consultants deny the existence of the respective equative forms altogether. To express the respective meaning, all speakers prefer the postposition *χuzen* 'like'.

Furthermore, the equative shows a few more differences from the other non-nominative cases. First, enclitic pronouns lack equative forms, Erschler (2010). Second, verbs do not exist that lexically assign the equative to the internal argument.

¹² See also Caha (2019: 144–148) for a discussion of its synchronic status.

Table 3. Case marking in Digor Ossetic wh-words.

	'who'	'who-pl'	'what'	'what-pl'
Nom	ka	ka-tɛ	tʃi	tʃi-tɛ
Acc	ke(<*kɛ-j)	ke-t-i	tʃi	tʃi-tɛ
Gen	ke(<*kɛ-j)	ke-t-i	tʃɛ-j	tʃɛ-j-t-i
Dat	kɛ-m- ɛn	kɛ-m- ɛn -t-i	tʃɛ-m- ɛn	tʃɛ-m- ɛn -t-i
Abl	kɛ-m- ɛj	kɛ-m- ɛj -t-i	tʃɛ-m- ɛj	tʃɛ-m- ɛj -t-i
Iness	- ¹³	-	tʃɛ-m-i	tʃɛ-m-i-t-i
All	kɛ- mɛ	kɛ- mɛ -t-i	tʃɛ- mɛ	tʃɛ- mɛ -t-i
Sup	kɛ- bel	kɛ- bel -t-i	tʃɛ- bel	tʃɛ- bel -t-i

The case paradigms of the *jes*- and *dɛr*-series indefinites derived from 'who' and 'what' are shown in Tables 4 and 5, respectively. In the indefinites derived with the prefix *jes*-, the case and number marking works exactly the same as in the respective bare wh-words, as the rightmost columns of Tables 4 and 5 show. The true case marker on the wh-stem, say, that of the dative or the ablative case, is accompanied by the oblique marker on the right edge of the word form, while repeating the true case marker is impossible: *jes-kɛ-m-ɛn-t-i* IDF-who-M-DAT-PL-OBL.

On the other hand, the indefinites formed with the suffix *-dɛr* exhibit interesting differences. First, in these items, the plural marking appears further from the stem than the indefinite suffix *-dɛr*. Second, the outer case marker in the plural may repeat the "true" case marker¹⁴, as shown in the second columns of Tables 4 and 5.

Table 4. Multiple case marking in Digor Ossetic 'who'-based indefinites.

	<i>-dɛr</i> series		<i>jes</i> - series	
Nom	ka-dɛr	ka-dɛr-tɛ	jɛf-kɛ	jɛf-kɛ-tɛ
Obl	ke-dɛr(-i)	ke-dɛr-t-i	jɛf-kɛ	jɛf-kɛ-t-i
Dat	kɛ-m- ɛn -dɛr	kɛ-m- ɛn -dɛr-t- ɛn /-t-i	jɛs-kɛ-m- ɛn	jɛs-kɛ-m- ɛn -t-i
Abl	kɛ-m- ɛj -dɛr	kɛ-m- ɛj -dɛr-t- ɛj /-t-i	jɛs-kɛ-m- ɛj	jɛs-kɛ-m- ɛj -t-i
All	kɛ- mɛ -dɛr	kɛ- mɛ -dɛr-tɛ- mɛ /-t-i	jɛs-kɛ- mɛ	jɛs-kɛ- mɛ -t-i
Sup	kɛ- bel -dɛr	kɛ- bel -dɛr-tɛ- bel /-t-i	jɛs-kɛ- bel	jɛs-kɛ- bel -t-i

A remark is in place regarding the morphophonology of the *jes*-series indefinites derived from 'what' presented in Table 5. In all of these, the initial affricate of the root is dissimilated from the sibilant of the prefix to produce /t/.

¹³ The inessive of 'who', *kemi*, has been reanalyzed as the wh-word 'where', see the discussion in the end of this section.

¹⁴ The traditional descriptions of Iron Ossetic Axvlediani (1963: 196), Abaev (1964: 29), Bagaev (1965: 257), and Medojty (2003: 145) do not mention this possibility. However, forms with two identical case markers occur in texts and are judged fully grammatical by native speakers. As for the traditional descriptions of Digor, Isaev (1966) does not mention plural forms of indefinites. Takazov (2009: 78) provides relevant paradigms, but does not mention that the plural forms of *dɛr*-series indefinites allow the pattern wh-CASE-PL-OBL.

Table 5. Multiple case marking in Digor Ossetic ‘what’-based indefinites.

	- <i>der</i> series		<i>jes</i> - series	
Nom	ʃi- <i>der</i>	ʃi- <i>der-tə</i>	jef-ti	jef-ti-tə
Acc	ʃi- <i>der</i>	ʃi- <i>der-tə</i>	jef-ti	jef-ti-tə
Gen	ʒej- <i>der</i>	ʒej- <i>der-t-i</i>	jes- <i>təj</i>	jes- <i>təj-t-i</i>
Dat	ʒe-m- en - <i>der</i>	ʒe-m- en - <i>der-t-en/-t-i</i>	jes- <i>tə-m-en</i>	jes- <i>tə-m-en-t-i</i>
Abl	ʒe-m- ej - <i>der</i>	ʒe-m- ej - <i>der-t-ej/-t-i</i>	jes- <i>tə-m-ej</i>	jes- <i>tə-m-ej-t-i</i>
Iness	ʒe-m- <i>i-der</i>	ʒe-m- ej - <i>der-t-i</i>	jes- <i>tə-m-i</i>	jes- <i>tə-m-i-t-i</i>
All	ʒe- me - <i>der</i>	ʒe- me - <i>der-tə-me/-t-i</i>	jes- <i>tə-me</i>	jes- <i>tə-me-t-i</i>
Sup	ʒe- bel - <i>der</i>	ʒe- bel - <i>der-tə-bel/-t-i</i>	jes- <i>tə-bel</i>	jes- <i>tə-bel-t-i</i>

Besides ‘who’, ‘what’, and the respective indefinites, a number of other wh-words require double case marking in the plural, but these items only exist in very few morphological cases. These are the allative and ablative case forms of *kəd* ‘when’ (16a); the wh-words ‘where to’ and ‘where from’ (which lack any other case forms, but bear the allative and the ablative marker, respectively) (16b), and *kemi* ‘where’, which historically is the inessive of *ka* ‘who’ (16c). All these follow the pattern X-CASE-PL-OBL. The same is true for the indefinites derived from these wh-words (16d). In this dataset, I do not provide separate translations for the respective singular and plural items, as English fails to make this distinction.

- (16) a. *kəd* ‘when’
 SG PL SG PL
*kəd-**ej*** ?*kəd-**ej**-t-i*¹⁵ *kəd-**me*** *kəd-**me**-t-i*
 when-ABL when-ABL-PL-OBL when-ALL when-ALL-PL-OBL
 ‘since when’ ‘until when’
- b. *ku-me* *ku-me-ti* *kutem-**ej*** *kutem-**ej**-t-i*
 where.to where.to-PL-OBL where.from where.from-PL-OBL
- c. *ke-m-i* *ke-m-i-t-i* *ke-m-i-**der*** *ke-m-i-**der**-t-i*
 who-M-OBL who-M-OBL-PL-OBL who-M-OBL-IDF who-M-OBL-IDF-PL-OBL
 ‘where’ ‘somewhere’
- d. *kume-**der*** *kume-**der**-t-i*
 where.to-IDF where.to-IDF-PL-OBL
 ‘to somewhere’
*kutem-**ej**-**der*** *kutem-**ej**-**der**-t-i*
 where.from-IDF where.from-IDF-PL-OBL
 ‘from somewhere’

Furthermore, the marking by superessive and the oblique appears in the following two deictic adverbials describing the path by which the movement proceeds: *a-bel-t-i* ‘along these grounds’ and *wo-bel-t-i* ‘along those grounds’.

The analysis of double case marking to be developed below is fully applicable to these “sporadic” items. However, given that they lack full paradigms, an alternative analysis is possible for them: synchronically, the case-marked form is reanalyzed as a single stem, while the *-i* marker after the plural is that of the locative. (Or, alternatively, *-ti* is an idiosyncratic allomorph of the plural that only occurs in these items.) Such an analysis would be much less natural for ‘who’ and ‘what’, which exhibit full case paradigms with predictable morphology and meanings.

¹⁵ Most consultants have rejected this form, and it does not occur in the texts I consulted.

5.2 Wh-words and indefinites with single case marking in the plural

Besides *ka* ‘who’ and *tʃi* ‘what’, a few more wh-words have full case paradigms and launch the respective series of indefinites that allow plural marking. These are *ketʃi*, *tʃiwaver*, and *tʂex^wen*, all meaning ‘which/what kind of’. However, neither these wh-words themselves, nor the respective indefinites exhibit double case marking in the plural.

The wh-word *ketʃi* shows mildly idiosyncratic case morphology in the singular – namely, it inserts the suffix *-m-* in the dative, ablative, and inessive¹⁶. However, the plural form of it and the *der*-series indefinite behave as regular lexical nouns, compare the respective columns in Table 6 and the paradigms of lexical nouns in Table 2.

Table 6. Paradigm of *ketʃi* ‘which’ and of *ketʃi-der* ‘some’.

	Sg	Pl	Sg	Pl
Nom	ketʃi	ketʃi-te	ketʃi-der	ketʃi-der-te
Obl	ketʃi-j	ketʃi-t-i	ketʃi-der-i	ketʃi-der-t-i
Dat	ketʃi-m- en	ketʃi-t- en	ketʃi-der- en	ketʃi-der-t- en
Abl	ketʃi-m- ej	ketʃi-t- ej	ketʃi-der- ej	ketʃi-der-t- ej
Iness	ketʃi-m-i	ketʃitimi/ ketʃimiti	ketʃi-der-i	ketʃi-der-t-i
All	ketʃi- me	ketʃi-te- me	ketʃi-der- me	ketʃi-der-te- me
Sup	ketʃi- bel	ketʃi-te- bel	ketʃi-der- bel	ketʃi-der-te- bel

The remaining two wh-words, *tʃiwaver*, and *tʂex^wen*, and the indefinites derived from them behave as consonant-final nouns, see Table 2 in Section 4.1.

To recapitulate, Digor has two types of wh-words and wh-based indefinites, namely, those that do and those that do not exhibit double case marking in the plural. A viable analysis must predict the difference between the two classes.

6 The structure of indefinites and of their plural forms

To proceed, we need to investigate the internal structure of indefinites and their plural-marked forms in Ossetic. To that end, and in order to explain the contrast in case exponence between lexical plurals and plural indefinites, we need to establish the overall structure of the DP in Ossetic.

6.1 The overall structure of DP in Digor

The basic assumptions I make here are, first, that Ossetic projects the DP, as was shown in Erschler (2019), and, second, that (interpretable) number marking in nominals is associated with the head Num⁰, which is situated below D, Ritter (1991; 1992; 1993). I also adopt the standard assumptions of DM regarding the existence of acategorial roots and categorizing functional heads, of which n⁰ is most relevant for our current discussion. Furthermore, I assume that case markers in Digor nominals are the spellout of Agr nodes that are right-adjoined to DP¹⁷. I remain agnostic

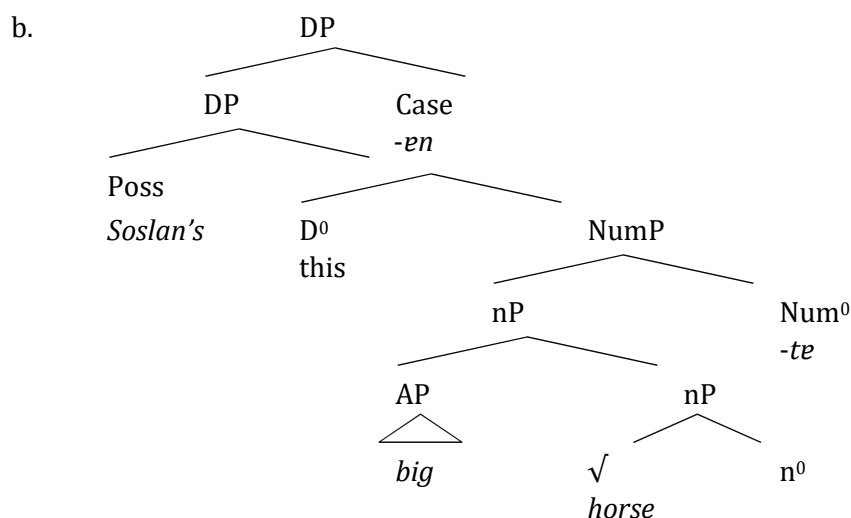
¹⁶ Surprisingly, for the locative plural of *ketʃi*, instead of the expected *ketʃi-t-i*, two unexpected forms are attested: *ketʃim-i-t-i* and *ketʃi-t-i-mi*, with some speakers reporting that they use both forms. I putatively suggest that the form *ketʃim-i-t-i* is created by analogy with the locative form *kemi-ti* discussed in the previous section, while *ketʃi-ti-mi* is the result of metathesis in that form. Otherwise, assuming the analysis *ketʃi-t-i-m-i* which-PL-OBL-M-OBL, it would be the only lexical item in Digor Ossetic with *-m-* not directly adjacent to the stem.

¹⁷ It is perhaps more common to assume that Agr nodes are projected by heads rather than adjoin to phrases, Embick (2000); Embick & Noyer (2001); Halle & Matushansky (2006); Kramer (2010); Norris

as to the existence of KP in Ossetic. Indeed, the fact that case marking may occur twice in the same M-word shows that the theory must countenance the existence of case features that are spelled out as case markers alongside case exponents that instantiate the K^0 head.

For a lexical DP, the overall structure will be then as shown in (17). The word order illustrated in (17a) is obligatory. I do not assume a consistently head-final DP, as is done for instance, for Turkish in von Stechow and Kornfilt (2017: 7), because no plausible candidates exist for a non-null DP-final D^0 . Furthermore, if D^0 is taken to be final in the DP, to account for the obligatory order possessor-demonstrative-NP, we will have to posit a null head Dem^0 , whose specifier is the demonstrative. While logically this is possible, I do not know of any evidence in favor of the specifier status (and, necessarily, the XP rather than X^0 status) of demonstratives in Ossetic.

- (17) a. *soslan-i* *atfi* *ustur* *bex-t-en*
 Soslan-OBL *this* *big* *horse-PL-DAT*
 ‘for these big horses of Soslan’s’



Alternatively, one could assume a systematically head-initial structure, as has been done, for instance, for Hungarian in Dékány (2021). However, that would involve significant revisions to the overall structure. For one thing, under such assumptions it is impossible to identify the morphological marker of plurality *-te* with the spellout of Num^0 (see a discussion of this point for Hungarian in Saab & Lipták (2016: 8), and in Cinque (2010) in a more general setting). This would require us to specify a morphological mechanism by which the plural marker is spelled out in the right position. However, as long as the existence of plural marking correlates with the presence of NumP in the structure, the proposal below can be modified to handle a consistently head-initial structure, at the price of certain complications.

Now, with this overall structure of the DP in mind, I will first address the structure of *wh*-stems and their plural forms, and then proceed to analyze derived indefinites.

(2014); and the general discussion in Norris (2022). However, to account for Ossetic facts, it is more natural to assume that the Agr node is adjoined to the DP as a whole. Hanink (2018) and Adamson (2019) have put forth proposals that, to account for the German adjectival inflection, the theory must countenance adjunction of Agr nodes to XPs (although their proposals vary as to the nature of the phrase implicated in the phenomenon under discussion). I thank Mark Norris for the latter two references.

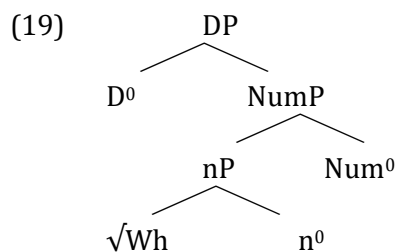
6.2 Wh-stems and their plural forms

In this section, I argue that the wh-items under discussion differ in their size as syntactic objects. While *ka* ‘who’ and *tʃi* ‘what’ are DPs (which can be taken to only consist of a D), the other three wh-words, *ketʃi*, *tʃiwaver*, and *tsɛχ^wen* ‘which, what kind of’ are (at most) nPs.

The reason to treat *ketʃi*, *tʃiwaver*, and *tsɛχ^wen* ‘which, what kind of’ as “small nominals,” in terms of Pereltsvaig (2006), rather than D’s is the following. These wh-words, and DPs where they appear as modifiers, can take the definiteness marker *i*, which I assume to be one of the forms of D in Digor.

- (18) a. du=ʃi i ketʃi-t-ɛj de ?
 you=3PL.ABL DEF which-PL-ABL be.PRS.2SG
 ‘From which of them are you?’ (lit. ‘You, of them, from which ones are?’)
 Ik’ati 2011: 16
- b. de=χaxur-t-ɛj fɛsdwar-me i ketʃi-j
 2SG=denunciation-PL-ABL outside-ALL DEF which-OBL
 fe-nt’uχston?
 PV-throw.PST.1SG
 ‘Which of your denunciations did I throw out?’ Ik’ati 2011: 168
- c. wed=webel i ketʃi bindzɛ fe-χχ^westɛj?
 then=2PL.SUP DEF which fly PV-bite.PST.3SG
 ‘What kind of a fly has bitten you?’ Ik’ati 2011: 48

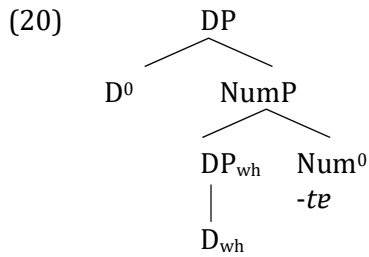
Accordingly, I assume that the structure of *ketʃi*, *tʃiwaver*, and *tsɛχ^wen* ‘which, what kind of’ is essentially identical to that of lexical nouns. That is, a bare wh-word will consist of a wh-root and a categorizing head, n^0 . In the plural, Num^0 is merged (19).



The case marking pattern in these items is then predicted to be the same as in lexical nouns, which, as we have seen, is borne out (modulo the allomorphy that the case exponents of *ketʃi* show in the dative, ablative, and inessive).

On the other hand, the wh-words ‘who’ and ‘what’ are incompatible with deictics, and therefore have to be full DPs. If they had a full articulate structure as in (19), we again would predict the case marking in the plural to be the same as for lexical nouns, contrary to the facts. Accordingly, we conclude that they must consist of a bare D, similarly to the proposal of Moskal (2015) for personal pronouns.

Now, to obtain the plural marking, the wh-words that consist of a bare D must merge an extra NumP on top of the DP. I disregard the possibility that extra functional material is merged between D and NumP, because there do not seem to be any indications for its existence. Given that the entire plural-marked wh-word has the distribution of a DP, I assume that an extra D is merged atop of NumP.



Direct evidence in favor of the higher D-layer comes from the interaction between such plurals and the comitative prefix *ed-*, which was shown to c-select for NumP by Erschler (2019), and to be incompatible with DPs. This prefix is indeed incompatible with plural indefinites, as is illustrated for the plural form of ‘who’ in (21a). To express the respective meaning, the postposition *χetstse* ‘with’, which selects for DPs, has to be used (21b).

- (21)
- | | | | | |
|----|---|----------------|---------------------|---------------------|
| a. | * <i>ed</i> | <i>ka-tɛ/</i> | <i>ke-t-i</i> | <i>erba-tsudte?</i> |
| | with | who.NOM-PL | who.OBL-PL-OBL | PV-arrive.PST.2SG |
| | ‘With whom (=what people) did you arrive?’ (intended) | | | |
| b. | <i>ke-t-i</i> | <i>χetstse</i> | <i>erba-tsudte?</i> | |
| | who.OBL-PL-OBL | with | PV-arrive.PST.2SG | |
| | ‘With whom (=what people) did you arrive?’ | | | |

To recapitulate, I have argued in this section that the presence of double case marking in the plural forms of *wh*-words correlates with the size of these words – those that are inherently DPs get it, while those that are lesser in size, behave as regular nouns.

6.3 The structure of indefinites

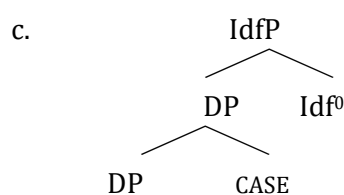
The indefinites under discussion are derived from the *wh*-stems by the prefix *jes-* and the suffix *-der*. We need to determine the position of these indefinite-forming affixes in the syntactic structure. Although *wh*-based indefinites, i.e. indefinites formed by a *wh*-stem and a dedicated affix, are fairly common cross-linguistically, Haspelmath (1997), their internal structure has not been systematically examined in the DM literature. In this section, I argue that the Ossetic indefinite affixes head a projection that takes DP as a complement.

A priori, an indefinite-forming affix may be either a separate head on the spine (22a) or an adjunct to the DP or an NP (22b), see a recent discussion of heads vs. modifiers in morphology in Gouskova & Bobaljik (2022) and references there. In these trees, I address indefinite suffixes; to treat the indefinite prefix *jes-*, obvious changes need to be made to the two trees.

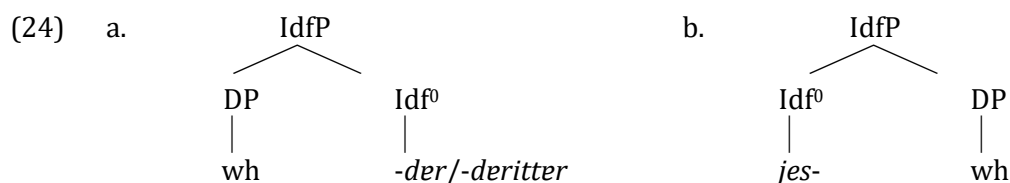


For a DP-sized *wh*-stem, these options can be told apart by the behavior of case markers. In the series marked with a suffix, case marking appears closer to the stem than the indefinite suffix, as is illustrated by the partial paradigms in (23a–b). Given that we have taken the case morphemes to correspond to an Agr node adjoined to DP, see the discussion in Section 6.1, it is natural to conclude that the indefinite suffix is the head of a higher projection (23c).

- (23) a. -*der*-series
 Nom ka-*der* *tʃi*-*der*
 Obl ke-*der* **ke*-*der*-i *tse*-*j-der*/**tse-der*-i
 All *ke-me-der* **ke*-*der*-*me* *tse-me-der*/**tse-der-me*



Accordingly, I conclude that the structure of singular DP-based indefinites is as shown in (24)¹⁸.



An objection may be raised to the idea that what is essentially a nominal might have additional structure above the level of DP. However, the same theoretical move has been argued to be necessary, for instance, in Hungarian, to accommodate dative possessors and associative plural markers, see Dékány (2021: 199, 219) and references there to the earlier literature. Importantly, IdfP in Ossetic (as well as the projections above the DP in Hungarian) are transparent for case assignment to, and phi-feature agreement with, the DP.

For NP-based indefinites, on the other hand, assuming the indefinite-forming affixes to be heads or modifiers does not lead to different empirical predictions. The only crucial condition is that the D head is merged to them after the indefinite affix. Assuming that the behavior of these affixes is uniform, it is natural to conjecture that they are always heads. However, as Gouskova & Bobaljik (2022) show, what looks like one and the same suffix may be a head in some environments and a modifier in others. I leave a systematic investigation of the head vs. modifier status of the indefinite-forming affixes for further research.

6.4 Plural-marked indefinites

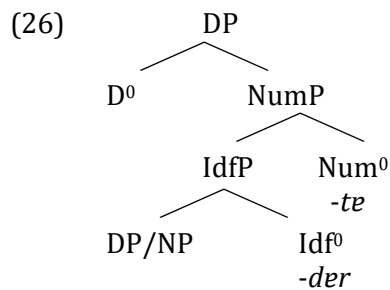
It remains to address the structure of the plural forms of the indefinites under discussion. Recall the order of morphemes in the non-nominative forms of the relevant indefinites of both types (25), where it is illustrated for the superessive case. A plausible structure of plural indefinites must account for this ordering.

- (25) Double-marking, DP-based indefinites
- a. IDF-wh-CASE-PL-OBL
 jes-ke-bel-t-i
 IDF-wh-SUP-PL-OBL

¹⁸ An anonymous reviewer raises the possibility that the syntactic positions of *jes*- and *der*- are non-identical, which could explain their different linear positions. While this indeed is a logical possibility, I am not aware of any evidence that will allow us to identify these positions. I must leave the matter for further research.

- b. wh-CASE-PL-IDF-CASE/-OBL
 ke-**bel**-der-te-**bel** / ke-**bel**-der-t-**i**
 wh-SUP-PL-IDF-SUP / wh-SUP-PL-IDF -OBL
 Single marking, nP-based indefinites
- c. IDF-wh-PL-CASE
 jes-keʈʈi-te-bel
 IDF-wh-PL-SUP
- d. wh-IDF-PL-CASE
 keʈʈi-der-te-bel
 wh-IDF-PL-SUP

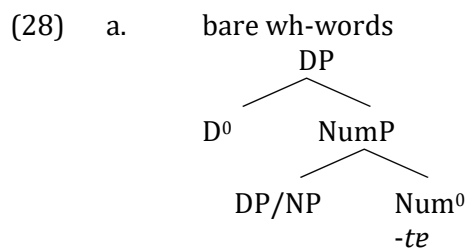
To account for both types of indefinites, it is enough to assume that Num⁰ uniformly merges after Idf⁰, no matter whether it is a DP-sized wh-word or an NP-sized one. The same considerations as in the case of bare wh-items show that the NumP projects a DP, as illustrated for *-der* in (26). For more proposals arguing in favor of multilayered DPs, see Clem & Dawson (2021) for Tiwa and Hankamer & Mikkelsen (2021) for Danish.

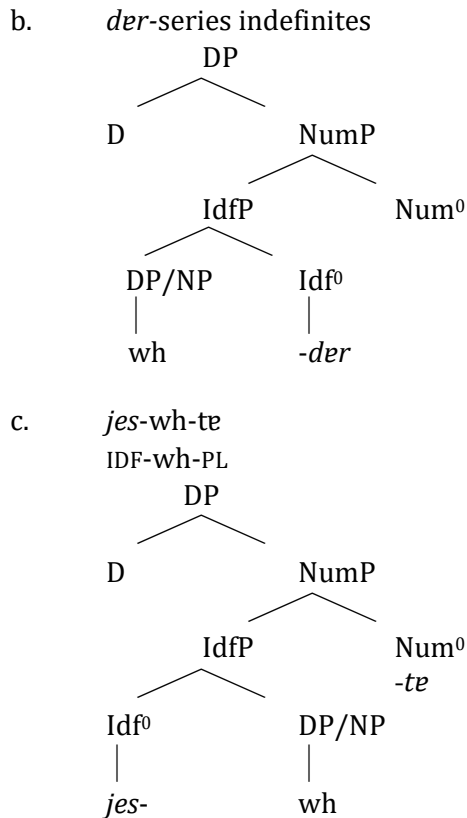


Adjuncts may be hosted between NumP and the higher D (27). The quantifier *bere* ‘many’ requires plural marking on the DP in Digor and therefore it must be situated above the NumP.

- (27) fe-Ɂuston bere enaxur ʈi-der-te
 PV-hear.PST.1SG many strangewhat-IDF-PL
 ‘I heard many strange things.’ Sk’odtati 2012: 192

To recapitulate, the structure of plurals I have argued for here is shown in (28).





Under the assumption that we have made that the case marker morpheme is a DP-adjunct, and assuming that both D heads receive a case value, we predict that in the plurals derived from D-sized *wh*-words, the case marker will appear twice, immediately to the right of each copy of D, given that each DP layer will have an Agr node adjoined to it. In this respect, my analysis of this instance of Multiple Exponence is similar to that of Marušič & Žaucer (2012) who argue that an Agr node can be inserted several times, leading to multiple exponence. On the other hand, in the plurals derived from nP-sized *wh*-words, case marking will only occur once.

The questions that remain unanswered so far are, first, how case is assigned to the internal DP and, second, what is responsible for the appearance of the oblique case marker, instead of the one corresponding to the expected specific case value, on the ambient DP (25a–b).

7 Narrow-syntax-based analyses of ME

With the internal structure of the items under discussions at hand, we are now in the position to determine whether our phenomenon is amenable to the existing analyses that treat some instances of ME as a direct outcome of processes taking place in narrow syntax. I argue that neither of two such proposals is applicable to our situations.

Baker and Willie (2010) analyze multiple exponence of agreement in Ibibio. They build upon the proposal of Pesetsky & Torrego (2007) to argue that, in Ibibio, the (multiple) goals that have to agree in phi-features with the subject first form a feature sharing chain between themselves, and then, when the highest functional head participating in the dependency agrees with the subject in its specifier, all the lower goals participating in the chain have their features checked.

However, in our case, D heads presumably serve as agreement goals, and by default do not enter in the Agree relationship with each other.

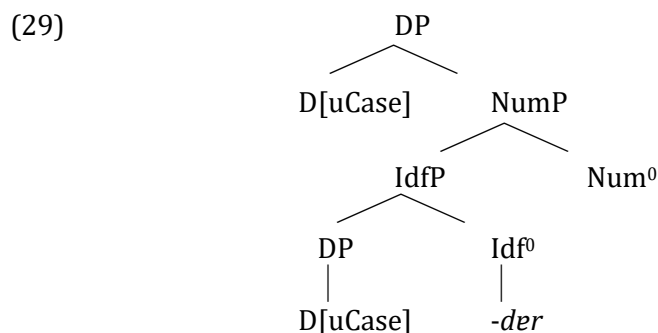
Oxford (2017) analyzes the multiple exponence of verb agreement markers in some Algonquian languages. He uses the well-established fact that in Algonquian languages, the verb includes T and C heads, both of which may, or have to, undergo agreement with the subject. He

proposes that, in a given language, certain goals may be able to agree with a probe which already underwent agreement with a different goal. This refines a proposal of Baker (2008), who had conjectured that such an ability (the Activity Condition) is a macroparameter, i.e. has to hold (or not to hold) for all the goals in a given language. On the proposal of Oxford (2017), in the Algonquian languages, if the respective T and C heads are able to agree with the same goal, double exponence emerges.

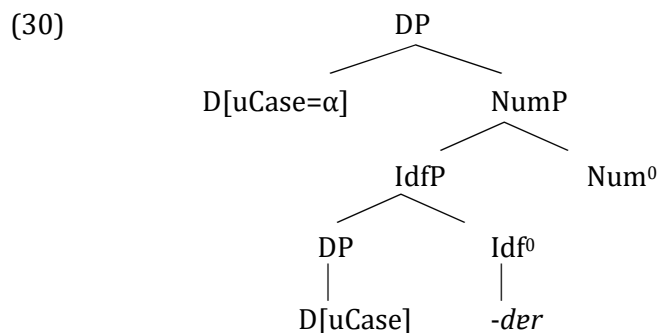
The analysis of Oxford (2017) cannot be extended to our case for the same reason as that of Baker & Willie (2010) cannot. The two D heads in the spine of our nominals (28) provide two goals, rather than two probes. For locality reasons, a probe will only agree with the nearest goal, that is, the higher D head. Accordingly, the valuation of the case feature on the lower D head will be blocked.

8 Case Assignment and Feature Transmission in structures with two D heads

I adopt the standard assumption that D heads are merged with their unvalued uninterpretable case feature, and for the derivation to converge, this feature must be valued. Accordingly, given the findings of Section 6.4, the plural form of an indefinite formed from a D-sized wh-word (i.e. of ‘who’ or ‘what’), or the plural form of such a wh-word itself, has two D heads with unvalued case features. I illustrate it in (29) for the plural of a *der*-series indefinite.



I remain agnostic as to the mechanism by which a DP as a whole gets its case valued. It can be achieved by agreement with an appropriate functional head, Chomsky (1981; 2000; 2001), or by a case-assigning algorithm (“dependent case theory”), Yip et al. (1987), Marantz (1991), Levin & Preminger (2015), Levin (2017), or perhaps by both, Baker & Vinokurova (2010). The resulting morphology does not depend on it. What is crucial, however, is that no matter what mechanism of case assignment is at work, only the case of the higher D head will be valued, given the standard locality assumptions. The case feature of the lower D will remain unvalued, and that would prevent the derivation from converging.



Accordingly, a mechanism must exist that values the case feature of the lower D. The logically possible ways to achieve this are (A) to make the same mechanism assign it to the lower D as to the higher D, (B) to assign the default case to it; and (C) to copy the feature values from the higher D as a last-resort operation.

Option (A) clearly violates the standard locality assumptions. Option (B) is empirically inadequate, as it predicts that the case value on the lower D will not depend on the case assigned to the entire DP, which is patently false – it is precisely the lower, i.e. the innermost, D that exhibits the case assigned to the DP as a whole, e.g. the dative and the allative, respectively, in (31a–b).

- (31) Dative *kəm-**en**-t-i* *kəm-**en**-dər-t-**en**/-i*
 Allative *kə-**mə**-t-i* *kə-**mə**-dər-tə-**mə**/-i*

Accordingly, we must make recourse to option (C), last-resort feature copying. A similar proposal has been made for the layered DP in Tiwa by Clem & Dawson (2021).

Independent evidence in favor of case transmission by feature copying between D heads comes from the case marking of appositives with pronouns, i.e., expressions of the type *we linguists*. In such appositives, both parts must be case-marked (32).

- (32) **men-me/*əz** **istorik-me** jew farsta jes
 I.NNOM-ALL/I.NOM historian-ALL one question exists
 ‘I an historian have a question.’

Such appositives form single DPs in Ossetic, as can be seen from their interaction with Wackernagel enclitics. DPs in Digor are impenetrable for 2P clitics, which otherwise are placed after the first word of the clause, (Erschler 2010: 7). Accordingly, impenetrability for clitics can be used as a DP-hood test. This is what obtains for appositives.

- (33) a. **men-me** **istorik-me**=babəj=deme jew farsta jes
 I.NNOM-ALL historian-ALL=again=2SG.ALL one question exists
 ‘I an historian again have a question to you.’
 b. ***men-me**=babəj=deme **istorik-me** jew farsta jes
 I.NNOM-ALL=again=2SG.ALL historian-ALL one question exists
 ‘I an historian again have a question to you.’ (intended)

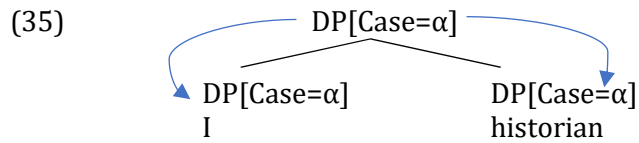
Accordingly, the structure of such an appositive must be as shown in (34), cf. a similar structure proposed for multiple definiteness marking in Greek in (Lekakou & Szendrői 2012: 114) and a proposal with a more fine-grained syntactic structure of determiners in (Kyriakaki 2020: 126)¹⁹.

- (34) [DP [DP *əz*] [DP *istorik*]]
 I historian

¹⁹ Jenks & Konate (2022: 13) argue that in the English *we students*, the pronoun occupies Spec DP. However, in Digor Ossetic, such a structure would be hard to reconcile with other ordering and case-marking facts. The initial constituent in a DP is an (oblique-marked) possessor (i), and it is natural to conclude that it occupies Spec DP, where it is assigned the genitive (spelled out as the syncretic oblique).

- (i) a. <soslan-i> *aʈfi* <*soslan-i> *ustur* *bəχ-en*
 Soslan-OBL this Soslan-OBL big horse-DAT
 ‘for this big horse of Soslan’s’

The case-marking facts in (32) then receive a natural interpretation if one makes use of the feature transmission operation.



The procedure of feature transmission proposed here might look suspiciously similar to concord, which, as we have seen in (17), is absent in Ossetic. However, the proposal does not overgenerate, because only DPs are taken to be able to receive case and to sprout the respective Agr nodes. Modifiers within a DP do not contain D heads and accordingly cannot participate in feature transmission.

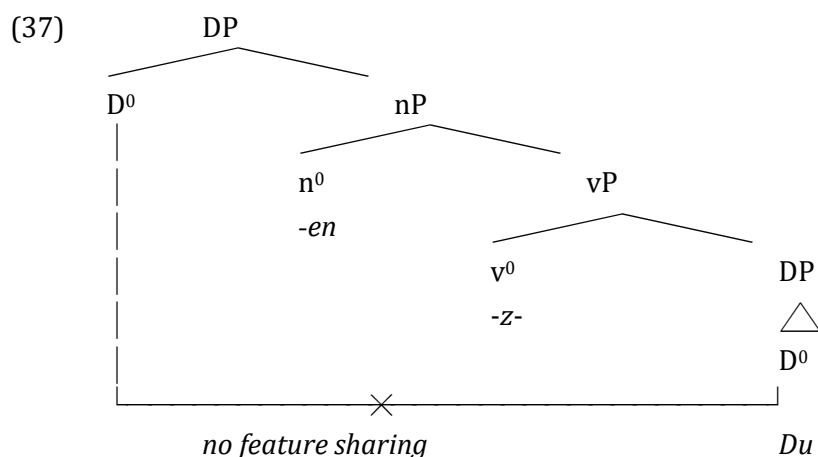
As a locality condition on this kind of feature transmission, I assume that it cannot cross category-defining heads. This is consistent with the proposal of Marantz (2007) that such heads are phasal. Evidence in favor of this locality condition comes from the case marking of nominals involving several category-defining heads. The Ossetic languages cannot form denominal verbs synthetically, so manifestations of locality with category-defining heads other than n^0 are hard to come by. There is no reason, however, to assume that last-resort feature transmission is an Ossetic-specific operation, so it is legitimate to look for such examples from other languages.

As one piece of evidence, consider the behavior of the German verbs *duz-en* ‘to address someone by Du’ and *siez-en* ‘to address someone by Sie’, which are formed on the basis of the respective pronouns. I assume German personal pronouns to instantiate, or at least to include, D^0 . These depronominial verbs can be nominalized in their turn: (*das*) *Du-z-en* ‘addressing by Du’, (*das*) *Sie-z-en* ‘addressing by Sie’. As nouns, these can be assigned case. However, the case cannot percolate to the embedded pronoun.

- (36) German
 Wie läuft das hier mit dem **Du-z-en**/***Dir-z-en**
 how goes it here with DEF.DAT you.NOM-V-NMZ/*you-DAT-V-NMZ
 eigentlich?
 properly
 ‘How does it work here with addressing people by ‘Du’?’²⁰

The absence of case percolation into the nominalisation is exactly what the proposed condition predicts. A category changing head intervenes between the two instances of D, as shown in (37), and case transmission becomes impossible. I assume that the embedded pronoun *Du* receives the default case.

²⁰ karrierebibel.de/duzen-siezen/, accessed on November 15, 2016. I thank Hagen Blix for a discussion of the German facts.



Furthermore, the German *das Ich* ‘ego’ must involve an n^0 layer atop of the DP corresponding to *ich* ‘I’. This is necessary to ensure that it has a noun-like distribution and be able to host gender, see Kramer (2015: 37) for the latter point. Given that the n-layer is impenetrable for case transmission, the noun becomes indeclinable, unlike the underlying pronoun. The case inflection patterns of the pronoun and the derived noun are compared in (38).

(38)

German		
Nominative	ich	das Ich
Accusative	mich	das Ich
Dative	mir	dem Ich

Similarly, the Russian depronominale noun *ja* ‘true self’, from *ja* ‘I’, is indeclinable, unlike the underlying pronoun. Again, the structure of this noun presumably is $[_{DP} D^0 [_{nP} n^0 [_{DP} ja]]]$.

To recapitulate the discussion of this section, I have argued in favor of the existence of a last-resort operation, feature transmission, that, modulo appropriate locality conditions, allows a lower head with an unvalued feature F to have the feature valued against a higher head of the same type. In our case, the heads are D . The existence of this operation will explain the double exponence of case on plural indefinites. What remains unexplained so far, is the fact that the outer case marker can be the oblique instead of that of the expected specific case value.

9 Dissimilation of case exponents

In this section, I address the spellout process that results in non-identical case exponents appearing in the plurals. This is obligatory for bare *wh*-words and *jes*-series indefinites, where only the plural marker *-te-* intervenes between the two case markers, and optional for *der*-series indefinites, where two morphs, the plural *-te-* and the indefinite *-der-* intervene between them, as illustrated in (39).

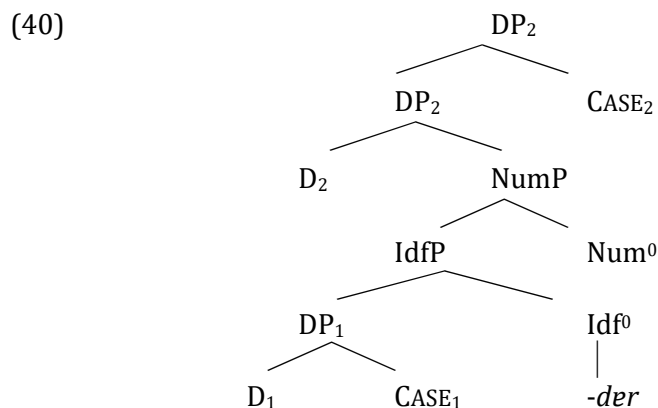
(39)

Dative	(jes)-kɛm- ɛn -t-i	kɛm- ɛn -dɛr-t-i (/ -ɛn)
Allative	(jes)-kɛ- mɛ -t-i	kɛ- mɛ -dɛr-t-i (/ -tɛ-mɛ)

I argue that the oblique case marker is inserted here to avoid haplology between the two case exponents. I propose that the oblique marker *-i* serves as the default non-nominative case marker. More specific exponents are prevented from being inserted by means of feature deletion. The difference between bare *wh*-words and *jes*-indefinites, on the one hand, and *-der*-indefinites on

the other hand, lays in the fact that *-der* is a suffix, which creates a longer distance between the two case exponents. That allows case dissimilation in *der*-series indefinites to be optional²¹.

To lay out the analysis in full detail, consider the tree for a plural indefinite with the Agr nodes corresponding to the case markers (40). For the sake of concreteness, I show the tree for *wh-der-PL*, the picture for the *wh-PL* and *jes-wh-PL* is fully identical, up to the position of the adjunct indefinite marker (28).



A priori, the following causes may lead to the non-identity of the exponents of CASE₁ and CASE₂ nodes. First, the case features assigned to D₁ and D₂ in narrow syntax may be non-identical. Otherwise, some dissimilation process must be implicated that leads to the spellout of the oblique in CASE₂. This dissimilation might be purely phonological, i.e. it might be driven by the need to prevent identical syllable rhymes from appearing too close to each other. The remaining alternative is that dissimilation occurs at some stage of morphological derivation.

I will first consider and reject the possibility that the non-identity of the exponents of CASE₁ and CASE₂ is determined in narrow syntax or in late-stage phonology, and then will make use of the approach of Nevins (2012) to dissimilation in morphology.

The possibility that D₁ and D₂ are assigned non-identical features in syntax can be rejected outright. Indeed, case is assigned in syntax to the entire nominal, i.e. to DP₂. On the other hand, this case value is expressed on the inner head, D₁ as is illustrated in (39). Accordingly, what we are dealing with here is some kind of dissimilation.

Furthermore, the dissimilation cannot be merely phonological. First of all, it is highly implausible that a purely phonological process exists that would create /i/ out of a diverse assortment of segmental sequences, which the Digor case markers are, as was shown in Table 1 above. Second, linearly close sequences of segments that are identical to the case markers are in principle tolerated, as illustrated in (41) for the dative *-en* and the ablative *-ej*.

- (41) a. The dative *-en* and ablative *-ej* vs. /*en*/ and /*ej*/ as a part of a root
 *kem-**en**-t-**en** vs. bad**en**-t-**en**
 who-DAT-PL-DAT vs. stool-PL-DAT
- b. The ablative *-ej* and /*ej*/ as part of the root
 *kem-**ej**-t-**ej** vs. z**ej**-t-**ej**
 who-ABL-PL-ABL vs. avalanche-PL-ABL

²¹ Optional dissimilation is attested cross-linguistically in phonology and morphology. For case studies of optional dissimilation in phonology see e.g. Stanton (2020: 15–16) about Sundanese (Austronesian) and McFarland (2009: 35) about Filomeno Mata Totonac (Totonacan). For a discussion of optional morphological dissimilation in Hakka (Sinitic), see Tseng (2008: 123).

Therefore, we must conclude that dissimilation occurs in morphology. Now, as Nevins (2012: 87–88) has argued, dissimilation of non-adjacent exponents must be brought about by feature deletion²². Observe that, in our settings, the dissimilating case markers are separated at least by the plural marker, and, in *der*-series indefinites, also by the indefinite marker (39). Accordingly, the items undergoing dissimilation are non-adjacent, and some feature deletion must occur.

To provide an appropriate feature representation of the case markers in Digor, I will, first of all, adopt the proposal to distinguish the abstract case and the morphological case that gets expounded, following McFadden (2004: 10–13); Legate (2008: 95); and the ensuing literature. In view of this, I assume that nominative forms lack morphological case features altogether. Furthermore, it is natural to consider the exponent /i/ as the default (non-nominative) case exponent, because it fulfills the functions of the accusative, the genitive and the inessive marker in the majority of the paradigms. For the rest of the cases, I assume that the featural representation is [NNOM, CASE], with CASE running over DAT, ABL, etc.

Accordingly, with both AGR nodes in (40) having the featural representation [NNOM, X], the case-specific feature X is then deleted from the outer case feature bundle, and the vocabulary item (VI) with the representation [NNom], that is, /i/, is inserted.

As for the directionality of dissimilation, it is not clear that a principled explanation is possible of why it is the outer case node that undergoes feature deletion. As Nevins (2012: 88) notes, cross-linguistic variation obtains in this respect. If dissimilation was obtained by allomorph choice rather than by feature deletion, and if Vocabulary Insertion proceeded from the bottom to the top of the tree simultaneously with, or prior to, linearization (Bobaljik 2000; Embick 2010: 42; Schreiner 2021: 19–20), the fact that it is the outer exponent that dissimilates would receive a natural explanation. However, as we have seen, the more plausible dissimilation mechanism here is feature deletion, and, furthermore, a number of counterarguments have been raised against pre-linearization VI insertion (Arregi & Nevins 2012: 238; Merchant 2015: 276–281; Haugen & Siddiqi 2016: 369). Accordingly, the direction of dissimilation has to be taken to be a language-specific, or perhaps even language and feature-specific, parameter.

10 Cross-linguistic picture

Plural-marked *wh*-words are not particularly uncommon cross-linguistically. However, the Ossetic-type double case marking system appears to be rarely if at all attested elsewhere. Typically, the plural forms of *wh*-words only bear one case marker (42). Indeed, as we have seen, even within Digor, not all *wh*-words exhibit double marking. The analysis proposed in this paper allows us to hypothesize why such a system is so rare.

- (42) a. Karachay-Balkar (Turkic, the North Caucasus)
 kim kim-le kim-**den** kim-le-**den**
 who.NOM who-PL who-ABL who-PL-ABL
- b. Georgian (South Caucasian, Georgia) Tschenkéli (1958: 196)
 ra ra-eb-i ra-**m** ra-eb-**ma**
 what.ABS what-pl-ABS what-ERG what-PL-ERG
- c. Kurag Agul (Northeast Caucasian, Russia) Magometov (1970: 114–115)
 fi fi-p:ur fit:-**i** fi-p:ur-**i**
 what.ABS what-PL.ABS what-ERG what-PL-ERG

²² For worked out examples of morphological dissimilation through feature deletion, see the case studies in Nevins (2012), as well as Oxford (2017: 716), who treats in this way the haplological dissimilation of linearly non-adjacent multiple agreement markers in Ojibwe (Algonquian).

- d. Finnish (Uralic, Finland) Karlsson (1999: 140)
- | | | | |
|---------|------------|----------|-------------|
| kuka | ke-t-kä | ke-tä | ke-i-tä |
| who.NOM | who-PL-NOM | who-PART | who-PL-PART |

Indeed, the analysis developed here predicts that for a *wh*-item to exhibit double case exponence in the plural, the following very specific combination of circumstances needs to obtain. First, the structure must contain two D heads on the spine of a single M-word. Second, the lower instance of D within this item has to be unable to be spelled out with a default case value, but rather must have its case properly valued. Third, even if these conditions are fulfilled, one of the resulting case exponents should not be deleted to avoid haplology. Probably, even more processes may conspire to conceal the double case marking on the PF. It is not particularly surprising therefore that systematic double case exponence of the kind attested in Ossetic is a typological rarity.

An additional reason for the rarity of such systems may be diachronic, see Harris (2008; 2010) for a discussion of how diachronic processes can lead to the emergence of typologically rare structures. Specifically in the case under discussion in this paper, an additional factor might be at play. Haspelmath (1993) proposed that a diachronic tendency exists that he called “externalization of inflection”. If a situation arises when inflectional markers appear word-internally, it is diachronically unstable, and the inflectional markers tend to “migrate” to the edge of the word. This tendency, if real, would also contribute to the rarity of the double case marking pattern discussed here – it is then predicted to be diachronically unstable²³, see the general observation about diachronic instability as a factor contributing to the typological rarity of some patterns in Greenberg (1978: 75).

11 Conclusion

In this paper, I have proposed a Distributed Morphology analysis of double case exponence in certain *wh*-words and *wh*-based indefinites in Digor Ossetic. This analysis supports the intuition that Multiple Exponence is not a single phenomenon, but can be brought about by a variety of morphosyntactic mechanisms.

²³ One of the reviewers, Ronald Kim, raises the question of the diachronic scenario that brought about the double case marking pattern in Ossetic. Specifically, he proposes that the external oblique marking could be a survival of the stage when the oblique suffix fulfilled the functions of other non-nominative cases that grammaticalized later from postpositions. While this proposal is highly plausible, to properly address this issue, we need to have at our disposal accounts of the diachrony of the case system and of indefinites in Ossetic. Furthermore, a conjecture needs to be made about the relative timing of these developments. While the grammaticalization of the case system in Ossetic has been the subject of systematic research (e.g., Kim 2003; Cheung 2008; Thordarson 2009), this is not the case, to the best of my knowledge, for the grammaticalization of indefinites.

Diachronically, *jes-* and its Iron regular cognate *if-* evidently go back to the existential form of the copula, *jes/ if*, see (32) for a sentential example. It stands to reason to assume that the *jes*-series are a result of univerbation of *jes wh* ‘there exists an X’, reflecting a stage when bare *wh*-words could be used as non-interrogative indefinites. It is unsurprising that *jes*-indefinites pattern together with bare *wh*-words.

On the other hand, the suffix *-der* is transparently cognate to the scalar marker, the enclitic =*der*., see (7c) for an example of its use. This enclitic, however, only combines with lexical DPs and follows number and case markers.

- | | | | | |
|-----|--------------|---------------|------------------|-------------------|
| (i) | bex-te=der / | *bex=der-te | bex-te-bel=der | /*bex=der-te-bel |
| | horse-PL=EMP | *horse=EMP-PL | horse-PL-SUP=EMP | *horse=EMP-PL-SUP |

Accordingly, a much more complicated grammaticalization process must have taken place in this case. Reconstructing this process goes well beyond the scope of this purely synchronically oriented paper.

Admittedly, the specific phenomenon addressed here is very rare. However, careful examination of typological *rara* has played a significant role in the development of linguistic theory. By its existence, a *rarum* reveals a grammatical mechanism that usually remains inoperative or hidden.

The phenomena that are brought to light by the Ossetic double case marking are, first, the possibility for a single nominal to involve several D heads, and, second, a mechanism of feature sharing between such heads.

However, the question always remains of why a given phenomenon is rare in the first place. It follows from the analysis proposed here that to observe this type of multiple case marking, several independent conditions must hold: the presence of two D heads within one nominal, the necessity of feature sharing between them, and lack of dissimilation processes radical enough to fully obliterate one of the case markers. The likelihood that all these conditions will be simultaneously fulfilled is not particularly high.

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Competing interests

The author has no competing interests to declare.

References

- Abaev, Vassily. 1964. *A Grammatical Sketch of Ossetic*. The Hague: Mouton.
- Adamson, Luke. 2019. Derivational trapping and the morphosyntax of inflectionlessness. Philadelphia, PA: University of Pennsylvania dissertation.
- Alcázar, Asier & Saltarelli, Mario. 2010. In support of a syntactic analysis of double agreement phenomena in Spanish. In Bok-Bennema, Reineke & Kampers-Manhe, Brigitte & Hollebrandese, Bart. (eds.), *Romance Languages and Linguistic Theory 2008: Selected papers from 'Going Romance' Groningen 2008*, 1–16. Amsterdam: John Benjamins.
- Arregi, Karlos & Nevins, Andrew. 2012. *Morphotactics: Basque auxiliaries and the structure of spellout*. Dordrecht: Springer.
- Axvlediani, Georgij. (ed.). 1963. *Grammatika osetinskogo jazyka*. Vol. 1. *Fonetika i morfologija* [Grammar of Iron Ossetic. Vol 1. Phonetics and Morphology.] Ordžonikidze: NII pri Sovete ministrov Severo-Osetinskoj ASSR.
- Bagaev, Nikolaj. 1965. *Sovremennyj osetinskij jazyk*. [Modern Iron Ossetic.] Ordžonikidze: Severo-Osetinskoe knižnoe izdatel'stvo.
- Bagirokova, Irina & Lander, Yury & Phelan, Paul. 2022. Number in West Circassian. In Acquaviva, Paolo & Daniel, Michael (eds.), *Number in the World's Languages: A Comparative Handbook* 261–304. Berlin, Boston: De Gruyter Mouton. <https://doi.org/10.1515/9783110622713-009>
- Baker, Mark C. 2008. *The syntax of agreement and concord*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CB09780511619830>

- Baker, Mark C. & Vinokurova, Nadya. 2010. Two modalities of case assignment case in Sakha. *Natural Language and Linguistic Theory* 28. 593–642. <https://doi.org/10.1007/s11049-010-9105-1>
- Baker, Mark C. & Willie, Willie Udo. 2010. Agreement in Ibibio: From every head to every head. *Syntax* 13. 99–132. <https://doi.org/10.1111/j.1467-9612.2009.00133.x>
- Bobaljik, Jonathan David. 2000. The ins and outs of contextual allomorphy. In Grohmann, Kleanthes K. & Struijke, Caro (eds.), *University of Maryland working papers in linguistics* 10, 35–71. College Park, MD: University of Maryland, Department of Linguistics.
- Caballero, Gabriela & Inkelas, Sharon. 2018. A construction-based approach to multiple exponence. In Booij, Gert (ed.), *The Construction of Words*, 111–139. Cham: Springer.
- Caha, Pavel. 2019. Case competition in Nanosyntax. A study of numeral phrases in Ossetic and Russian. Ms. lingbuzz/004875
- Cheung, Johnny. 2008. The Ossetic case system revisited. In Lubotsky, Alexander & Schaeken, Jos & Wiedenhof, Jeroen & Derksen, Rick & Siebinga, Sjoerd (eds.), *Evidence and counter-evidence: Essays in honour of Frederik Kortlandt*, Vol. 1, 87–105. Leiden: Brill.
- Chomsky, Noam. 1981. *Lectures on government and binding: The Pisa lectures*. Holland: Foris.
- Chomsky, Noam. 2000. Minimalist inquiries: The framework. In Martin, Roger & Michaels, David & Uriagereka, Juan (eds.), *Step by step: Essays on minimalist syntax in honor of Howard Lasnik*, 89–155. Cambridge, MA: MIT Press.
- Chomsky, Noam. 2001. Derivation by phase. In Kenstowicz, Michael J. (ed.), *Ken Hale: A life in language*, 1–52. Cambridge, MA: MIT Press.
- Cinque, Guglielmo. 2010. *The syntax of adjectives. A comparative study*. Cambridge, MA: MIT Press. <https://doi.org/10.7551/mitpress/9780262014168.001.0001>
- Clem, Emily & Dawson, Virginia. 2021. The emergence of case matching in discontinuous DPs. Ms., University of California, San Diego & Western Washington University.
- Deal, Amie Rose. 2016. Plural exponence in the Nez Perce DP: a DM analysis. *Morphology* 26. 313–339. <https://doi.org/10.1007/s11525-015-9277-9>
- Dékány, Éva. 2021. *The Hungarian nominal functional sequence*. New York: Springer.
- Dum-Tragut, Jasmin. 2009. *Modern Eastern Armenian*. Amsterdam, Philadelphia: Benjamins.
- Embick, David. 2000. Features, syntax, and categories in the Latin perfect. *Linguistic Inquiry* 31(2). 185–230. 10.1162/002438900554343
- Embick, David. 2010. *Localism versus globalism in morphology and phonology*. Cambridge, MA: MIT Press. <https://doi.org/10.7551/mitpress/9780262014229.001.0001>
- Embick, David, & Noyer, Rolf. 2001. Movement operations after syntax. *Linguistic Inquiry* 555–595. 10.1162/002438901753373005.
- Erschler, David. 2010. Modularity and 2P clitics: Arguments from Digor Ossetic. In Falk, Yehuda (ed.), *Proceedings of IATL* 25. <http://linguistics.huji.ac.il/IATL/25/Erschler.pdf>
- Erschler, David. 2019. A new argument for existence of the DP in languages without articles. *Journal of Linguistics*. 55(4). 879–887. <https://doi.org/10.1017/S0022226719000288>
- Erschler, David. 2022. A dedicated nominal singular morpheme without singulative semantics. *Morphology* 32(2). 249–276. <https://doi.org/10.1007/s11525-022-09392-2>
- Gouskova, Maria & Bobaljik, Jonathan David. 2022. The lexical core of a complex functional affix: Russian baby diminutive *-onok*. *Natural Language & Linguistic Theory*: 1–41. <https://doi.org/10.1007/s11049-021-09530-1>
- Greenberg, Joseph H. 1978. Diachrony, synchrony and language universals. In Greenberg, Joseph H. & Ferguson, Charles A. & Moravcsik, Edith A. (eds.), *Universals of Human Language*, Vol. 1, 61–91. Stanford, CA: Stanford University Press.
- Halle, Morris. 1997. Distributed Morphology: Impoverishment and fission. In *MIT working papers in linguistics 30: PF—Papers at the interface*, 425–449. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, MA.
- Halle, Morris & Matushansky, Ora. 2006. The Morphophonology of Russian Adjectival Inflection. *Linguistic Inquiry* 37. 351–404. <https://doi.org/10.1162/ling.2006.37.3.351>
- Hanink, Emily. 2018. Postsyntactic inflection of the degree phrase in German. *Proceedings of the Linguistic Society of America* 3. 1–15. <https://doi.org/10.3765/plsa.v3i1.4308>

- Hankamer, Jorge & Mikkelsen, Line. 2021. CP complements to D. *Linguistic Inquiry* 52. 473–518. https://doi.org/10.1162/ling_a_00387
- Harris, Alice. 2008. On the Explanation of Typologically Unusual Structures. In Good, Jeff (ed.), *Language universals and language change*, 54–76. Oxford: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199298495.003.0003>
- Harris, Alice. 2010. Explaining typologically unusual structures: the role of probability. In Wohlgenuth, Jan & Cysouw, Michael (eds.), Wohlgenuth, Jan, and Michael Cysouw. *Rara and rarissima: Documenting the fringes of linguistic diversity*, 91–104. Berlin, New York: Mouton de Gruyter. <https://doi.org/10.1515/9783110220933.91>
- Harris, Alice. 2017. *Multiple exponence*. Oxford: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780190464356.001.0001>
- Harris, James & Halle, Morris. 2005. Unexpected plural inflections in Spanish: Reduplication and metathesis. *Linguistic Inquiry* 36.2. 195–222.
- Haspelmath, Martin. 1993. The diachronic externalization of inflection. *Linguistics* 31. 279–309. <https://doi.org/10.1515/ling.1993.31.2.279>
- Haspelmath, Martin. 1997. *Indefinite pronouns*. Oxford: Clarendon Press.
- Haugen, Jason D. & Siddiqi, Daniel. 2016. Towards a restricted realization theory. In Siddiqi, Daniel & Harley, Heidi (eds.), *Morphological metatheory*, 343–386. Amsterdam: Benjamins.
- Isaev, Magomed. 1966. *Digorskij dialekt osetinskogo jazyka*. [The Digor Dialect of Ossetic.] Moscow: Nauka.
- Jenks, Peter & Konate, Rassidatou. 2022. Indexed definiteness. *Glossa: a journal of general linguistics* 7(1). doi: <https://doi.org/10.16995/glossa.5717>
- Karlsson, Fred. 1999. *Finnish: An Essential Grammar*. London: Routledge.
- Kayne, Richard. 2010. Toward a syntactic reinterpretation of Harris & Halle (2005). In Bok-Bennema, Reineke & Kampers-Manhe, Brigitte & Hollebrandese, Bart. (eds.), *Selected papers from 'Going Romance' Groningen 2008, 2*, 145–170. Amsterdam: Benjamins.
- Kim, Ronald. 2003. On the historical phonology of Ossetic: The origin of the oblique case suffix. *Journal of the American Oriental Society* 123.1. 43–72. <https://doi.org/10.2307/3217844>
- Kornfilt, Jaklin. 1997. *Turkish*. London, New York: Routledge.
- Kramer, Ruth. 2010. The Amharic Definite Marker and the Syntax–Morphology Interface. *Syntax* 13. 196–240. <https://doi.org/10.1111/j.1467-9612.2010.00139.x>
- Kramer, Ruth. 2015. *The morphosyntax of gender*. Oxford: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199679935.001.0001>
- Kyriakaki, Maria. 2020. Definite expressions and degrees of definiteness. In Bjorkman, Bronwyn M. & Hall, Daniel Currie (eds.), *Contrast and Representations in Syntax*, 99–137. Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198817925.003.0005>
- Lekakou, Marika & Szendrői, Kriszta. 2012. Polydefinites in Greek: Ellipsis, close apposition and expletive determiners. *Journal of Linguistics* 48. 107–149. doi.org/10.1017/S0022226711000326
- Legate, Julie Anne. 2008. Morphological and abstract case. *Linguistic Inquiry* 39. 55–101. <https://doi.org/10.1162/ling.2008.39.1.55>
- Levin, Theodore. 2017. Successive-cyclic case assignment: Korean nominative-nominative case-stacking. *Natural Language & Linguistic Theory* 35.2. 447–498. <https://doi.org/10.1007/s11049-016-9342-z>
- Levin, Theodore & Preminger, Omer. 2015. Case in Sakha: Are two modalities really necessary? *Natural Language and Linguistic Theory* 33. 231–250. <https://doi.org/10.1007/s11049-014-9250-z>
- Magomedbekova, Zagidat. 1971. *Karatinskij jazyk*. [Karata] Tbilisi: Mecniereba.
- Magometov, Alexander. 1970. *Agul'skij jazyk. Issledovanija i teksty*. [Agul. Studies and texts.] Tbilisi: Mecniereba.
- Marantz, Alec. 1991. Case and licensing. In Westphal, Germán & Ao, Benjamin & Chae, Hee-Rahk (eds.), *Eastern States Conference on Linguistics (ESCOL)*. Vol. 8, 234–253. Ithaca, NY: CLC.
- Marantz, Alec. 2007. Phases and words. In Choe, Sook-Hee (ed.), *Phases in the theory of grammar*, 191–222. Seoul: Dong-In Publishing Co.

- Marušič, Franc & Žaucer, Rok. 2012. On Slovenian demonstrative reinforcers and the internal structure of demonstratives. In Marković, Maja & Halupka-Rešetar, Sabina & Milićević, Nataša & Milić, Tanja (eds.), *Selected Papers from SinFonIJA 3*, 76–104. Newcastle upon Tyne: Cambridge Scholars.
- McFadden, Thomas. 2004. The position of morphological case in the derivation: A study on the morphology-syntax interface. Philadelphia, PA: University of Pennsylvania dissertation.
- McFarland, Teresa Ann. 2009. The phonology and morphology of Filomeno Mata Totonac. Berkeley, CA: University of California dissertation.
- McGinnis-Archibald, Martha. 2016. Distributed morphology. In Hippisley, Andrew & Stump, Gregory (eds.), *The Cambridge Handbook of Morphology*, 390–423. Cambridge: Cambridge University Press.
- Medojty, Bobolka. 2003. *Nyrykkon Iron ævzag. Morfologi*. [Modern Iron Ossetic. Morphology.] Cxinval: South Ossetian University.
- Merchant, Jason. 2015. How much context is enough? Two cases of span-conditioned stem allomorphy. *Linguistic Inquiry* 46. 273–303. doi: 10.1162/ling_a_00182
- Moskal, Beata. 2015. Limits on allomorphy: A case study in nominal suppletion. *Linguistic Inquiry* 46(2). 363–376. doi: 10.1162/ling_a_00185
- Müller, Gereon. 2007. Extended exponence by enrichment: Argument encoding in German, Archi, and Timucuan. *Proceedings of PLC30. UPenn Working Papers in Linguistics*. V. 13. <http://repository.upenn.edu/cgi/viewcontent.cgi?article=1517&context=pwpl>
- Nevins, Andrew. 2012. Haplological dissimilation at distinct stages of exponence. In Trommer, Jochen, (ed). *The morphology and phonology of exponence*, 84–116. Oxford: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199573721.003.0003>
- Norris, Mark. 2014. A Theory of Nominal Concord. Santa Cruz, CA: University of California dissertation.
- Norris, Mark. 2022. Nominal inflection in Distributed Morphology. Ms., lingbuzz/006516.
- Noyer, Rolf. 1997. *Features, Positions and Affixes in Autonomous Morphological Structure*. Garland Publishing, New York.
- Oxford, Will. 2017. The Activity Condition as a microparameter. *Linguistic Inquiry* 48(4). 711–722. https://doi.org/10.1162/LING_a_00260
- Pereltsvaig, Asya. 2006. Small Nominals. *Natural Language and Linguistic Theory* 24. 433–500. <https://doi.org/10.1007/s11049-005-3820-z>
- Pesetsky, David & Torrego, Esther. 2007. The syntax of valuation and the interpretability of features. In Karimi, Simin & Samiiian, Vida & Wilkins, Wendy K. (eds.), *Phrasal and clausal architecture: Syntactic derivation and interpretation. In honor of Joseph E. Emonds*, 262–294. John Benjamins Publishing.
- Plank, Frans (ed.) 1995. *Double case: Agreement by Suffixaufnahme*. Oxford, New York: Oxford University Press.
- Ritter, Elizabeth. 1991. Two functional categories in Modern Hebrew noun phrases. In Rothstein, Susan D. (ed.), *Perspectives on phrase structure: Heads and licensing*, 37–60. San Diego, CA: Academic Press.
- Ritter, Elizabeth. 1992. Cross-linguistic Evidence for Number Phrase. *Canadian Journal of Linguistics* 37. 197–218. <https://doi.org/10.1017/S0008413100021952>
- Ritter, Elizabeth. 1993. Where's Gender? *Linguistic Inquiry* 24. 795–803. <https://www.jstor.org/stable/4178843>
- Saab, Andrés & Lipták, Anikó. 2016. Movement and deletion after syntax: Licensing by inflection reconsidered. *Studia Linguistica* 70(1). 66–108. <https://doi.org/10.1111/stul.12039>
- Shanidze, Ak'ak'i. 1976. *Dzveli kartuli enis gramat'ik'a*. [A Grammar of Old Georgian.] Tbilisi: Tbilisi Universit'et'is gamocemloba.
- Schreiner, Sylvia L. R. 2021. Span-conditioned allomorphy and late linearization: Evidence from the Classical Greek perfect. *Glossa: a journal of general linguistics* 6(1). 64. doi: <https://doi.org/10.5334/gjgl.1400>
- Stanton, Juliet. 2020. Aggressive reduplication and dissimilation in Sundanese. *Phonological Data and Analysis* 2.5: 1–35. <https://doi.org/10.3765/pda.v2art5.25>

- Takazov, Fedar. 2009. *Grammatičeskij očerk osetinskogo (digorskogo) jazyka*. [A grammar sketch of Digor Ossetic.] Vladikavkaz: North-Ossetian State University Publishing.
- Thordarson, Fridrik. 2009. *Ossetic grammatical studies*. Veröffentlichungen zur Iranistik 48. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.
- Tschenkéli, Kita. 1958. *Einführung in die georgische Sprache. Band 1. Theoretischer Teil*. Zürich: Amirani Verlag.
- Tseng, Yu-Ching. 2008. A Typology of Syntactic OCP Effects— a study of OCP in Hakka syntax and Optimality Theory. Albany, NY: State University of New York dissertation.
- von Heusinger, Klaus & Kornfilt, Jaklin. 2017. Partitivity and case marking in Turkish and related languages. *Glossa: a journal of general linguistics* 2(1): 20. <https://doi.org/10.5334/gjgl.112>
- Yip, Moira & Maling, Joan & Jackendoff, Ray. 1987. Case in tiers. *Language* 63. 217–250. <https://doi.org/10.2307/415655>
- Zgusta, Ladislav. 1965. Zu den Subsystemen des Sprachsystems: eine scheinbare Unregelmässigkeit der ossetischen Deklination. In Heinz, Adam & Karaś, Mieczysław & Milewski, Tadeusz & Safarewicz, Jan & Taszycki, Witold (eds.), *Symbolae linguisticae in honorem Georgii Kuryłowicz*, 379–382. Wrocław: Polska Akademia Nauk.

Sources of text examples

- Ik'ati, Avdul. 2011. *Cardi ajdænæ*. [Life's looking glass.] Dzæugighæw: CINÆI RPX.
- Maliti, Batraz. 1995. *Orsanæ*. [Orsana.] Dzæugighæw: Ir.
- Maliti, Batraz. 2006. *Togvændag*. [The Path of blood.] Dzæugighæw: Ir.
- Sk'odtati, Elbrus. 2012. *Fæsonirxæg*. [Musings.] Dzæugighæw: Ir.