Case assignment and the linear order of coordinated verbs[*]

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Abstract

In this paper, we draw on corpus data to show that in Icelandic, verbs that assign distinct cases can be coordinated and share a single object: the verb on the right determines the case that the object bears. However, it turns out that fine-grained details of how case is realized on the object morphologically have an effect on which verb is more likely to come first: the one that assigns accusative or the one that assigns dative. If the object is syncretic for accusative and dative, then there is no preference, and both word orders are equally frequent. If the object is not syncretic, then there is a preference to put the dative-assigning verb last. But this preference is not equal for all objects: when the accusative is realized by a zero affix, the preference is weaker than when the accusative is realized by a non-zero affix. We present an analysis of these facts that is grounded in formal spellout mechanisms and the following two guiding principles: choose the order that expresses the most case features, and choose the order that uses the fewest mechanisms. Non-syncretic objects vary in the strength of the preference in a way that can be connected to these two principles, as long as we make certain specific assumptions about how spellout works, most importantly that zero affixes result from the absence of Vocabulary Insertion, rather than the insertion of a phonologically empty symbol, and Impoverishment exists as a spellout mechanism, one that is distinct from Vocabulary Insertion.

1 Introduction

Bresnan and Thráinsson (1990) argued that apparent cases of verb coordination, such as the example in (1), involve true coordination of heads, and cannot be reduced to phrasal coordination with a silent object in the first conjunct.

(1)   Jón   keypti og borðaði matinn.
        John.NOM bought and ate   food.the.ACC
        'John bought and ate the food.'   (Bresnan and Thráinsson 1990:360)

Bresnan and Thráinsson (1990) further claimed that such verb coordination is only possible if both verbs assign the same cases, and provided the examples in (2) in support of this.

(2) a. Jón lýsti matnum og Jón borðaði matinn.
John.NOM described food.the.DAT and John.NOM ate food.the.ACC
'John bought and ate the food.'

b. * Jón lýsti og borðaði {matinn / matnum}.
John.NOM described and ate {food.the.ACC / food.the.DAT}
INTENDED: 'John described and ate the food.' (Bresnan and Thráinsson 1990:361)

In (2a), we see that *lýsa* 'describe' assigns dative case to its object, while *borða* 'eat' assigns accusative case to its object. In (2b), we see that these verbs cannot be coordinated with each other, regardless of what case shows up on the object.

Bresnan and Thráinsson (1990) do not say more about the case-matching requirement for verb coordination as it pertains to objects, but we can immediately note two things. First, in the example that they judge as ungrammatical in (2b), the verb that assigns accusative comes second. We will refer to this as the v_{DAT} & v_{ACC} order, and contrast it with the opposite order, which we will refer to as the v_{ACC} & v_{DAT} order. We will see below that the choice of word order is a potentially important factor in speakers' intuitions about these constructions. Second, Bresnan and Thráinsson (1990) do not say anything about whether an object that happens to be syncretic in a structure like (2b) would make the example possible. The reason to ask this question is that syncretic objects seem to 'bypass' case-matching requirements in a number of languages and constructions, and has been reported for Icelandic for a number of constructions, including ATB-movement and coordinate object drop (Rögnvaldsson 1990, 1993; Ximenes 2007; Sigurðsson and Maling 2010). Indeed, Zaenen and Karttunen (1984) present the examples in (3), which also involve verb coordination in the v_{DAT} & v_{ACC} order. They claim that (3a) (their example (4)) is ungrammatical whether the object is accusative or dative, but that the same coordination of verbs is grammatical (for only some speakers) when the object is syncretic for accusative and dative, as shown in (3b) (their example (12)).[1]

(3) a. * Hann stal og borðaði {kökunni / kökuna }.
he stole$_{+DAT}$ and ate$_{+ACC}$ {cake.the.DAT / cake.the.ACC }
INTENDED: 'He stole and ate the cake.'

b. Hann stal og borðaði köku.
he stole$_{+DAT}$ and ate$_{+ACC}$ cake.ACC/DAT
'He stole and ate cake.'

Likewise, E.F. Sigurðsson and Wood (2021:38) claim that some speakers find (4b) to be fine while

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[1]We will annotate the glosses of verbs with subscripts '+DAT' and '+ACC' to indicate what case they normally assign.

(4a) is degraded, apparently because the bare NP object in (4b) is syncretic for dative and accusative, while the definite-suffixed object in (4a) is not.

(4)   a. ?? Strákurinn   stal   og eyðilagði   bílinn.
           boy.the.NOM stole$_{+DAT}$ and destroyed$_{+ACC}$ car.the.ACC
           'The boy stole and destroyed the car.'

        b.   Strákurinn   stal   og eyðilagði   bíl.
           boy.the.NOM stole$_{+DAT}$ and destroyed$_{+ACC}$ car.ACC/DAT
           'The boy stole and destroyed a car.'

In this paper, we argue on the basis of the results of a corpus study that contrary to the general claim in Bresnan and Thráinsson (1990), accusative-assigning verbs can be coordinated with dative-assigning verbs. The case that shows up is the one that is assigned by the righthand verb (see also, e.g., a short discussion in Rúnarsson and E.F. Sigurðsson 2020 in the context of Right Node Raising). We provide an attested example from our corpus in (7). As shown in (5) and (6), *hvetja* 'encourage' assigns accusative case, while *hjálpa* 'help' assigns dative. When these verbs are coordinated in the v_{ACC} & v_{DAT} order, as shown in (7), the object shows up in the dative case.

(5)   að hvetja   fólk
      to encourage$_{+ACC}$ people.ACC
      'to encourage people'

(6)   að hjálpa   fólki
      to help$_{+DAT}$ people.DAT
      'to help people'

(7)   að hvetja   og hjálpa   { fólki   / *fólk   }
      to encourage$_{+ACC}$ and help$_{+DAT}$ { people.DAT / *people.ACC }
      'to encourage and help people'

While this example is in the opposite order from the example presented earlier, we do find attested examples of verb coordination with the v_{DAT} & v_{ACC} order, even without ACC/DAT syncretism. We again provide an attested example from our corpus in (10). As shown in (8) and (9), *bæta* 'improve' assigns accusative case, while *breyta* 'change' assigns dative. When these verbs are coordinated in the v_{DAT} & v_{ACC} order, as shown in (7), the object shows up in the accusative case.

(8)   að bæta   reglur
      to improve$_{+ACC}$ rules.ACC
      'to improve rules'

(9)   að breyta   reglum
      to change$_{+DAT}$ rules.DAT
      'to change rules'

(10)   að breyta   og bæta   { reglur   / *reglum   }
      to change$_{+DAT}$ and improve$_{+ACC}$ { rules.DAT / *rules.ACC }
      'to change and improve rules'

These examples show that accusative-assigning and dative-assigning verbs can be coordinated, and that the verb that is linearly the closest, which in all cases in the present paper is the verb on the right, is the verb that determines the overt case on the object.

However, beyond documenting the existence of such constructions, we also find at least three additional, more nuanced patterns in the data. First, when the object is not syncretic for accusative and dative, then the order v_{ACC} & v_{DAT} is more frequent than v_{DAT} & v_{ACC} (Ingimundarson et al. 2022). We show this with the overall frequency data from our corpus study in the table in (11) below.

(11)

	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
Syncretic Object	102	**52%**	93	**48%**	195
Non-Syncretic Object	256	**64%**	145	**36%**	401
Total	358	**60%**	238	**40%**	596

This result reinforces the judgments of some speakers, who find the v_{ACC} & v_{DAT} order to be more acceptable than the v_{DAT} & v_{ACC} order. It also dovetails with the observation above that the example that Bresnan and Thráinsson (1990) judged as unacceptable was indeed in the v_{DAT} & v_{ACC} order that some speakers find degraded (especially when the object is not syncretic).

Second, the table in (11) also shows that when the object is syncretic for accusative and dative, the frequency effect disappears: the order v_{ACC} & v_{DAT} is just as frequent as the order v_{DAT} & v_{ACC}. This suggests that like other case-matching phenomena, morphological syncretism can improve an example that would otherwise be degraded or unacceptable (see references above on Icelandic, and see also Groos and Van Riemsdijk 1981; Zaenen and Karttunen 1984; Franks 1995; Citko 2005; Asarina 2011, 2013; Hein and Murphy 2020 for other languages). It also suggests that the frequency difference discussed in the previous paragraph is not due to some independent feature of dative-assigning verbs that makes them more likely to come last. Rather, there is something about how verb coordination interacts with the assignment and/or realization of case that is responsible for the frequency patterns.

Third, we will show that the way that syncretism does or does not arise makes a difference as to how strong the bias is toward the v_{ACC} & v_{DAT} order. We will flesh out what this means in what follows, but in short, there are different ways that the morphology can identify a case-difference. Accusative and dative can be distinct, for example, because they are expressed with different affixes. But they can also be distinct because one is expressed with an affix and the other gets no affix at all. This distinction turns out to make a difference in how strong the bias is for v_{ACC} & v_{DAT} over the v_{DAT} & v_{ACC} order, and we propose an analysis of this distinction that is grounded in formal spellout mechanisms. We treat the word order effect as a kind of competition: when all else is equal, the order that yields the best results for realizing case features wins.[2] The "best" is determined by two guiding principles:

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[2]Of course, all else is not always equal. However, our results suggest that in general, with enough data, the other factors that influence word order in this domain ultimately balance out. See Horn (2019) for a detailed and insightful discussion of the factors that influence word order in conjunctions.

- **Maximum Expression**: Express the most possible features.

- **Least Effort**: Do the least work.

Non-syncretic objects vary in the strength of the "dative preference" in a way that can be connected to these two principles. Syncretic objects generally tie on both of these (unless, as we will see, the syncretism is due to phonology) so the dative preference disappears.

More broadly, our study suggests that word order choice can be affected by relatively surface-level factors, including fine-grained details of how features are (or are not) expressed morphologically. Despite this, the effects are not entirely surface-level, since we will see that phonological syncretism is distinct from feature-based syncretism. We will also see that morphological zeros have a special status in the system in that they involve the non-expression of features, rather than the expression of features by a zero.

The remainder of the paper is organized as follows. In section 2, we provide a general overview of the preference for the v_{ACC} & v_{DAT} order over the v_{DAT} & v_{ACC} order, which we refer to as the v_{DAT}-final preference. In section 3, we provide a preliminary overview of our assumptions about inflection features and spellout mechanisms. In section 4, we discuss the structures that have the strongest v_{DAT}-final preference, and show how these cases are analyzed with the mechanisms of section 3 and the two principles discussed above. In section 5, we do the same with the structures that have a weaker v_{DAT}-final preference, and show how our analysis makes sense of how these are different from the structures discussed in section 4. In section 6, we show how our analysis derives the structures with syncretism, where there is no word order preference. In section 7, we discuss a case where case-syncretism is derived in the phonology, and show how this case does not have the neutralizing effect on word order frequency that other cases of syncretism have. We show how our analysis makes sense of this fact. Section 8 concludes, and is followed by an appendix that discusses some more nuanced cases that raise some interesting questions, but do not bear on the conclusions from earlier sections.

2   The v_{DAT}-Final Preference

We first came across what we refer to as the 'v_{DAT}-final preference' in the form of speaker judgments. When a v_{ACC} such as *kúga* 'extort' is coordinated with a v_{DAT} such as *hóta* 'threaten', some speakers find it acceptable to coordinate the verbs in either order when the object is syncretic for accusative and dative, as shown in (12a) and (13a), but prefer the v_{ACC} & v_{DAT} order when the object is not syncretic for accusative and dative, as shown by the contrast between (12b) and (13b).

(12) Karlmaður á sjötugsaldri var dæmdur fyrir að kúga$_{+\text{ACC}}$ og hóta$_{+\text{DAT}}$…
man in 60s was convicted for to extort and threaten
'A man in his 60s was convicted for extorting and threatening…'

a. **konu** á sama aldri
woman.DAT/ACC the same age
'a woman the same age.'

b. **tveimur konum**.
two women.DAT
'two women.'

(13) Karlmaður á sjötugsaldri var dæmdur fyrir að hóta$_{+\text{DAT}}$ og kúga$_{+\text{ACC}}$…
man in 60s was convicted for to threaten and extort
'A man in his 60s was convicted for threatening and extorting…'

a. **konu** á sama aldri
woman.DAT/ACC the same age
'a woman the same age.'

b. ?? **tvær konur**.
two women.ACC
'two women.'

Following this observation, we conducted a corpus study of verb coordination.[3] We searched Parliament speeches in the Icelandic Gigaword Corpus (malheildir.arnastofnun.is/?mode=rmh2019; Barkarson et al. 2022) for strings of coordinated verbs, and manually coded the results for the verbs involved, the cases they assign, the case borne by the object, the inflection class, gender and number of the object, whether the object's case morphology was syncretic for the two cases of the verbs, and the order that the verbs appeared in.[4] We discovered that things are in fact even more nuanced than we indicated earlier. Consider the table in (14).

(14) (Non)Syncretic Objects

		v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
A	Masculine Singular Syncretic	4	44%	5	56%	9
	Feminine Singular Syncretic	64	50%	64	50%	128
B	Neuter Plural Non-Syncretic	57	55%	46	45%	103
	Neuter Singular Syncretic	34	59%	24	41%	58
	Neuter Singular Non-Syncretic	44	59%	31	41%	75
	Masculine Singular Non-Syncretic	30	59%	21	41%	51
	Feminine Singular Non-Syncretic	22	59%	15	41%	37
C	Masculine Plural Non-Syncretic	44	71%	18	29%	62
	Feminine Plural Non-Syncretic	59	81%	14	19%	73

In the table in (14), we divide the results into three classes of effects. In Class A, there is no strong

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[3]We thank Finnur Ágúst Ingimundarson, who carried out the initial corpus study. His work forms the basis of a squib on coordination of verbs which assign different cases each (Ingimundarson et al. 2022). In the current paper we take a more detailed look at the results of the study, and made some of the manual adjustments discussed in footnote 4.

[4]We also manually removed cases that introduced confounds, such as cases where three verbs were coordinated, where the object was coordinated (unless both conjuncts happened to be the same inflection class), or where there was something else unusual about the example.

preference. In Class B, there is a weak preference for the v_{ACC} & v_{DAT} order. In Class C, there is a strong preference for the v_{ACC} & v_{DAT} order.[5]

For each of the classes above, we will compare the way that accusative is realized with the way that dative is realized. Setting aside Class A for the moment, we find the generalizations in (15) and (16).[6]

(15) **Class B**
　　　　Dative is expressed with **an overt morpheme**
　　　　Accusative is expressed with **no case morpheme**

(16) **Class C**
　　　　Dative is expressed with **an overt morpheme**
　　　　Accusative is expressed with **an overt morpheme**

We illustrate these generalizations with a paradigm for the masculine noun *hundur* 'dog' in (17). There, we see that in the singular, which is Class B, there is a morphological distinction between accusative and dative because there is no overt case morpheme in the accusative, while there is an overt case morpheme in the dative. In the plural, which is Class C, there *is* an overt case morpheme in the accusative, which is distinct from the overt case morpheme in the dative.

(17)

	hundur 'dog'	
	MASC SG	MASC PL
NOM	hund + -r　　→ *hundur*	hund + -a-r → *hundar*
ACC	hund + $\boxed{\text{-Ø}}$ → *hund*	hund + $\boxed{\text{-a}}$　→ *hunda*
DAT	hund + -i　　→ *hundi*	hund + -um → *hundum*

With this much in place, consider again the two morphosyntactic factors that we suggest affect the choice of word order:

- **Maximum Expression**: Express the most possible features.

- **Least Effort**: Do the least work.

When we look at the details of case realization, we will find that in Class A, ACC and DAT tie on both of these factors, so there is no preference for word order in that case. In Class B, DAT wins 'maximum expression', but ACC and DAT tie on 'least effort'. This corresponds to a weak preference for dative case, and therefore the v_{ACC} & v_{DAT} order that leads to dative case. In Class C,

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[5]Note that in the plural, with ordinary nouns (and in our sample), accusative and dative are never syncretic with any gender. This is why there are no 'plural syncretic' categories in the table in (14). More broadly, 1st and 2nd person plural pronouns are syncretic for accusative and dative, and there are some non-inflecting nouns (certain proper names and loan words) that might be syncretic for all cases in the plural. None of those, however, are in our dataset, so we do not have any examples of accusative/dative syncretism in the plural.

[6]We will argue below that this even applies to the neuter singular syncretic class, contrary to first impressions, because that syncretism is derived in the phonology.

DAT wins 'maximum expression' *and* 'least effort'. This corresponds to a strong preference for the dative case, and thus the v_{ACC} & v_{DAT} order.

3 Preliminaries: Inflection Features and Spellout Mechanisms

Before presenting the data and analysis in more detail, we must first provide some preliminary information about the inflection features and spellout mechanisms that we assume for the purposes of this study. Turning first to noun inflection features, we follow most of the literature on case morphology and assume that case features are neither primitive nor privative, but are instead decomposed and binary. We adopt the specific analysis of Müller (2005) for Icelandic, which has the decomposition shown in (18)–(20).

(18) Case Features
  nominative $[-n,-v,-obl]$
  accusative $[-n,+v,-obl]$
  dative $[-n,+v,+obl]$
  genitive $[+n,+v,-obl]$

(19) Gender Features
  masculine $[-fem,+masc]$
  feminine $[+fem,-masc]$
  neuter $[-fem,-masc]$

(20) Inflection Class Features
  class a $[+a\text{-type},-i\text{-type},-c\text{-type}]$
  class i $[-a\text{-type},+i\text{-type},-c\text{-type}]$
  class u $[-a\text{-type},-i\text{-type},-c\text{-type}]$
  class c $[-a\text{-type},-i\text{-type},+c\text{-type}]$
  weak/strong $[\pm weak]$

Müller (2005) proposes 12 inflection classes across three genders: 3 weak classes (one for each gender), 4 masculine strong classes, 4 feminine strong classes, 1 neuter strong class. The table in (21), from Müller (2005), is somewhat simplified (there are more sub-classes, etc.), but will suffice for our purposes, and could be adapted to account for the minor variations of these classes.[7,8]

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[7]For a more detailed study of Icelandic inflection classes, see Thomson (1987), Svavarsdóttir (1993), Kvaran (2005), Sigurðsson (2005) and Rögnvaldsson (2013:158–169).

[8]A representative of each inflection class in the table is given in (i):

(i) 1 Ma: *hund-ur* 'dog', 2 Na: *borð* 'table', 3 Fa: *kinn* 'cheek', Fa′: *drottning* 'queen', 4 Mi: *stað-ur* 'place', 5 Fi: *mynd* 'picture', 6 Mu: *fjörð-ur* 'fjord', 7 Mc: *fót-ur* 'foot', 8 Fc1: *geit* 'goat', 9 Fc2: *vík* 'bay', 10 Mw: *penn-i* 'pen', 11 Nw: *aug-a* 'eye', 12 Fw: *húf-a* 'cap'

(21) Icelandic Inflection Classes   (Müller 2005:235)

	1 Ma	2 Na	3 Fa(′)	4 Mi	5 Fi	6 Mu	7 Mc	8 Fc1	9 Fc2	10 Mw	11 Nw	12 Fw
nom sg	ur	Ø	Ø	ur	Ø	ur	ur	Ø	Ø	i	a	a
acc sg	Ø	Ø	Ø (u)	Ø	Ø	Ø	Ø	Ø	Ø	a	a	u
dat sg	i	i	Ø (u)	Ø	Ø	i	i	Ø	Ø	a	a	u
gen sg	s	s	ar	ar	ar	ar	ar	ar	ur	a	a	u
nom pl	ar	Ø	ar	ir	ir	ir	ur	ur	ur	ar	u	ur
acc pl	a	Ø	ar	i	ir	i	ur	ur	ur	a	u	ur
dat pl	um	um	um	um	um	um	um	um	um	um	um	um
gen pl	a	a	a	a	a	a	a	a	a	a	(n)a	(n)a

There are several advantages to adopting Müller's system unchanged. First, it is fairly thorough and explicit, and is the most detailed existing account of Icelandic noun inflection in a post-syntactic theory of morphology like Distributed Morphology. Second, it takes the actual markers of exponence quite seriously. For example, much of the analysis is aimed at understanding why *-r* appears where it does, instead of assuming that some exponents just happen to end in /r/. Most importantly of all, there are a lot of choices one can make in the analysis of an inflectional system, and in this paper we are correlating rather fine-grained properties of that analysis with word-order choice in coordination. Since Müller's system was developed entirely independently of the present considerations, the fact that the results line up in the way that they do is quite striking.

Having established the inflectional features that we assume, we now turn to our assumptions about spellout. We adopt a general Distributed Morphology model of spellout, where the syntax assembles roots and abstract features that do not have any phonological features. When a syntactic structure is transferred to PF, the hierarchically arranged feature bundles are subject to various local adjustments. For present purposes, the most important will be language-specific Impoverishment rules which delete certain morphosyntactic features before Vocabulary Insertion determines the phonological realization of syntactic features. It is important that this is understood as deletion, and not as a process where features are 'consumed' by Vocabulary Insertion of zeros, as in Trommer (1999, 2003).[9]

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[9]See Trommer (2012) for a detailed overview of approaches to zero-exponence, which we cannot do justice to here. For the time being, we will only note three assumptions that are necessary for our account. First, as mentioned in the text, Impoverishment cannot be understood as insertion of zeros. Second, zeros could be inserted in certain cases, such as if they are specified for a particular environment, and in those cases the zero would consume the feature as Trommer

For Vocabulary Insertion, we follow the standard assumptions of the Subset Principle, the Elsewhere Condition, etc. However, there are two assumptions that we adopt about Vocabulary Insertion that are worth highlighting. First, Vocabulary Insertion replaces the morphosyntactic features that they realize with phonological features. This is essentially the approach to Vocabulary Insertion in Trommer (1999, 2003) and Bobaljik (2000), and distinct from Embick (2015) (where Embick (2015) proposes that Vocabulary Insertion only replaces a placeholder symbol for phonological content, not the formal features themselves). Second, and most importantly, we also assume that when there is no matching Vocabulary Item, Vocabulary Insertion does not take place—so nothing is inserted.[10] The special status of deleting features (Impoverishment) and not inserting anything (Zeros as Non-Insertion) will play an important role in the analysis that follows.

4 Strong v_{DAT}-Final Preference: M/F Plurals

We begin with Class C, which includes masculine and feminine plurals, and shows the strongest preference for the v_{ACC} & v_{DAT} order. We repeat the relevant frequency data in (22).

(22)

	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
Masculine Plural Non-Syncretic	44	**71%**	18	**29%**	62
Feminine Plural Non-Syncretic	59	**81%**	14	**19%**	72

In (23), we present sample paradigms for masculine and feminine plural nouns for reference.

(23)

	FEM PL *kinn* 'cheek'	MASC PL *hundur* 'dog'
NOM	kinn + -a-r $\rightarrow$ *kinnar*	hund + -a-r $\rightarrow$ *hundar*
ACC	kinn + -a-r $\rightarrow$ *kinnar*	hund + -a $\rightarrow$ *hunda*
DAT	kinn + -um $\rightarrow$ *kinnum*	hund + -um $\rightarrow$ *hundum*

In (24)–(26), we present Müller's Vocabulary Items that we use for masculine and feminine plurals.

(24) **Non-Oblique Suffix**
/r/ $\leftrightarrow$ $\{[-\text{obl}]\}$

(25) **Dative Plural**
/um/ $\leftrightarrow$ $\{[+\text{pl}],[-\text{n},+\text{v},+\text{obl}]\}$

(26) **Nominative/Accusative Plural**

    a. /i/ $\leftrightarrow$ $\{[+\text{pl}],[-\text{a-type},-\text{c-type}]\}$

    b. /u/ $\leftrightarrow$ $\{[+\text{pl}],[-\text{a-type}]\}$

    c. /a/ $\leftrightarrow$ $\{[+\text{pl}],[-\text{n}]\}$

proposes. Third, elsewhere zeros are not actually inserted, but are instead the absence of insertion.

[10]We also assume that Fission may take place as part of Vocabulary Insertion, realizing a subset of features but leaving the remaining features behind.

For feminine plurals, nothing more needs to be said, and Vocabulary Insertion proceeds. In (27), we show the relevant abstract features in the second row, using *kinn* 'cheek' as our example. The first column then indicates which Vocabulary Items are inserted. The second and third columns show the feature bundles for accusative and dative respectively, being replaced whenever a Vocabulary Item is inserted to replace a formal feature.

(27)

kinn 'cheek'	ACC	DAT
[+pl],[+fem],[+a-type]	[−n, +v, −obl]	[−n,+v,+obl]
Vocabulary Insertion (25)		*-um*
Vocabulary Insertion (24)	[−n, +v], *-r*	
Vocabulary Insertion (26c)	[+v], *-a-r*	
→ Phonology	*kinn-a-r*	*kinn-um*

For accusative, when the Vocabulary Item in (24) is inserted, the original accusative feature bundle [−n, +v, −obl] becomes [−n, +v], as the [−obl] feature is replaced by the phonological exponent /r/. When (26c) is inserted, [−n, +v] becomes [+v], as the [−n] feature is replaced by the phonological exponent /a/. No more rules apply; the [+v] is left unrealized—it is not expressed by any phonological exponent, not even a Ø. The phonology combines the stem *kinn* with the exponents /a/ and /r/, to form the accusative plural *kinnar*.[11] The ACC column thus shows what would happen if the accusative feature bundle were being realized, which as we stated above, is what would happen if we had the v_{DAT} & v_{ACC} order. In contrast, the feature bundle for dative is only subject to one instance of Vocabulary Insertion. When the Vocabulary Item in (25) is inserted, the original dative feature bundle [−n, +v, +obl] is replaced by the phonological exponent /um/ in its entirety. Nothing else happens. The phonology combines the stem *kinn* with the exponent /um/, to form the dative plural *kinnum*.[12]

We can now discuss why dative case, and thus the v_{ACC} & v_{DAT} order that leads to dative case, is so strongly preferred with feminine plurals. Dative beats accusative on 'least effort', because only one instance of Vocabulary Insertion takes place. But dative also beats accusative on 'maximum expression', because all three case features are expressed morphologically; at the end of the derivation, no case features are left unexpressed. With the accusative, at least one case feature, namely the [+v] feature, is always left unexpressed. And in fact, the example above illustrated the best case scenario. As one can see by looking at the Vocabulary Items in (26a) and (26b), some noun classes do not realize any case features other than the [−obl] feature (which is realized as /r/

[11]This is the same form that would have resulted from the nominative; the only difference would be that it would be the [−v] feature that would be unexpressed.

[12]Müller (2005) points out that it is crucial that the Vocabulary Items be ordered, for example by specificity (or perhaps in some cases extrinsically). If (26c) applied to the dative feature bundle, then an /a/ would be inserted and the remaining features would be [+v, +obl]. The /um/ exponent would never be inserted. However, since /um/ realizes more features, it gets priority by the Subset Principle.

for all classes). These 'competition results' are summarized in (28).

(28) **Feminine Plural**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion	x2	x1	DAT (less effort)
Max. Expression	Case Features	≤ 2	3	DAT (more features expressed)

As we can see here, the accusative requires two instances of Vocabulary Insertion and realizes a maximum of two case features. The dative requires only one instance of Vocabulary Insertion and realizes all three case features.

We turn now to the masculine plural, which is similar, but with a twist, because there is an Impoverishment rule that applies to the accusative. This rule, along with a plain English paraphrase of it, is shown in (29).[13]

(29)   **Impoverishment Rule E**
$[-\text{obl}] \rightarrow \emptyset$ / {[+pl],[+masc,−c-type],[−n,+v]} __

$\approx$ *'Delete [−obl] for plural masculine accusatives (unless they are class-c)'*

Impoverishment rules delete features prior to Vocabulary Insertion, so we list them first in the tables that follow. In (30), we show how the same same Vocabulary Items discussed above, plus the masculine-specific impoverishment rule, derives the accusative and dative plural forms of *hundur* 'dog'.[14]

(30)

hundur 'dog'	ACC	DAT
[+pl],[+masc],[+a-type]	[−n, +v, −obl]	[−n,+v,+obl]
Impoverishment (29)	[−n, +v]	
Vocabulary Insertion (25)		*-um*
Vocabulary Insertion (26c)	[+v], *-a*	
$\rightarrow$ Phonology	*hund-a*	*hund-um*

For accusative, the impoverishment rule applies and deletes the [−obl] feature, so [−n, +v, −obl] becomes [−n, +v], but no phonological exponent, not even a Ø, is inserted.[15] Just as with the feminine, the [−n] feature is realized as /a/, and the phonology combines the stem *hund* with the exponent /a/ to form the accusative plural form *hunda*. The dative is handled exactly as it was with

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[13]We call this 'Impoverishment Rule E' because Müller (2005) lists five impoverishment rules, (a)–(e), and this is his (e). We do the same with the other impoverishment rules discussed below. As mentioned above, we are adopting Müller's system and spellout rules without modification.

[14]Note that with different inflection class features, we get different vowels, regardless of gender, but this does not bear on the present point.

[15]At this point, we could model impoverishment as insertion of zeros, as proposed by Trommer (1999, 2003), and get the same result. We will see later, however, that this analysis will not make the correct distinctions in other cases.

the feminine plural. Impoverishment Rule E does not apply, because there is no [−obl] feature, and the same Vocabulary Item for dative, expressing all the case features, is inserted because that Vocabulary Item does not distinguish between different genders (or noun classes, for that matter).[16]

As was the case with feminine plurals, and for similar reasons, dative case, and thus the v_{ACC} & v_{DAT} order that leads to dative case, is strongly preferred with masculine plurals. Dative beats accusative on 'least effort', because only one instance of Vocabulary Insertion takes place with the dative. With the accusative, there is one instance of Impoverishment and one instance of Vocabulary Insertion. Dative also beats accusative on 'maximum expression', because just as before, all three case features are expressed morphologically and no case features are left unexpressed. With the accusative, at most one feature is actually expressed, namely the [−n] feature. But just as with the feminine plurals, some noun classes do not realize any case features, and even the [−obl] feature is not expressed. These 'competition results' are summarized in (31).

(31)   **Masculine Plural**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion	x1	x1	DAT (less effort)
	Impoverishment	x1		
Max. Expression	Case Features	≤1	3	DAT (more features expressed)

As we can see here, accusative requires two operations while dative requires only one. Moreover, accusative realizes at most one case feature, while dative realizes all three.

What we have seen in this section is that for masculine and feminine plurals, the dative wins on both criteria: it expresses more features and does less work, and this corresponds to a strong preference to choose the v_{ACC} & v_{DAT} order. One might wonder at this point whether Maximum Expression or Least Effort alone is enough to derive these results. We will see next that neither is enough. If Maximum Expression were enough on its own, we would expect neuter plurals to show exactly the same effects, because dative realizes more features than accusative in neuter plurals, just as with masculine and feminine. What we will see next, however, is a different generalization that operates over the Class B cases, with the weak preference for v_{ACC} & v_{DAT} order. Dative still wins on Maximum Expression, but it ties on Least Effort, a result that spans various idiosyncratically distinct specific cases. This also shows that Least Effort is not enough on its own. Least Effort alone would predict the Class B cases to same as the syncretic Class A, since Class B cases tie on Least Effort. We now discuss this in more detail as we turn to the weak v_{DAT}-final preference.

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[16]Notice that the syncretism between nominative and accusative in the feminine plural is due to the fact that the feature distinguishing nominative and accusative, the [±v] feature, is not realized. The same holds for accusative masculine plurals, but on the surface, there is a distinction between nominative and accusative because the [−obl] feature is realized in the nominative as /r/, but deleted by impoverishment in the accusative, and thus not realized at all. This 'indirect source' for non-syncretism will play an important role in the discussion below.

5 Weak v_{DAT}-Final Preference

In Class B, we see a preference for the v_{ACC} & v_{DAT} order, but it is not quite as strong (Class B of the table in (14) is repeated as (32)).

(32) (Non)Syncretic Objects

	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
Neuter Plural Non-Syncretic	57	55%	46	45%	103
Neuter Singular Syncretic	34	59%	24	41%	58
Neuter Singular Non-Syncretic	44	59%	31	41%	75
Masculine Singular Non-Syncretic	30	59%	21	41%	51
Feminine Singular Non-Syncretic	22	59%	15	41%	37

This class includes the neuter plurals, and all of the singular non-syncretic examples. It also includes *syncretic* neuter singulars. We set this aside for now, and return to it below, where we will see that this syncretism is derived in the phonology, which explains why it patterns the way it does. We will begin by looking in detail at masculine singulars, and then turn to neuter singulars and plurals.

In (33)–(34), we show the two Vocabulary Items that are used for the masculine singular nouns in question. Note that (33) is repeated from (24) above. In (35), we present Impoverishment Rule A, which will also be used for masculine singulars.[17]

(33) **Non-Oblique Suffix**
/r/ $\leftrightarrow$ {[$-$obl]}

(34) **Masculine/Neuter Sg Dative Suffix**
/i/ $\leftrightarrow$ {[$-$pl],[$-$weak,$-$fem,$-$i-type],[$+$obl]}

(35) **Impoverishment Rule A**
[$-$obl] $\rightarrow$ Ø / {[$-$pl],[$-$n,$+$v]} __

$\approx$ *'Delete [$-$obl] for singular (masculine) accusatives'*

(36) shows a sample paradigm for a (non-syncretic) masculine singular noun.

(36)

	MASC SG *hundur* 'dog'
NOM	hund + -r $\rightarrow$ *hundur*
ACC	hund + -Ø $\rightarrow$ *hund*
DAT	hund + -i $\rightarrow$ *hundi*

Applying the Vocabulary Items and Impoverishment Rules to the accusative and dative feature bundles, we get the derivations in (37).

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[17]This rule's formulation does not specify masculine, but in practice generally only applies to masculine, because it is bled by other rules which apply to feminine and neuter nouns.

(37)

hundur 'dog'	ACC	DAT
[−pl],[−weak,+masc,−fem]	[−n, +v, −obl]	[−n,+v,+obl]
Impoverishment (35)	[−n, +v]	
Vocabulary Insertion (34)		[−n, +v], *-i*
→ Phonology	*hund*	*hund-i*

There are a couple of things to note at this stage. First, notice that even though we introduced the Vocabulary Item in (33) as part of this paradigm, it is not used in (37). In fact, it is used only in the nominative, to derive the form *hundur*.[18] Second, notice that actually no features are realized for the accusative at all—Vocabulary Insertion does not apply. This is in contrast with the dative, where the [+obl] feature is spelled out as *-i* (IPA = [ɪ]). Instead, there is an Impoverishment rule that applies in the accusative, deleting the [−obl] feature. That is why the Vocabulary Item in (33) is only inserted in the nominative, and not the accusative.

The results of the competition between the two forms is shown in (38).

(38) **Masculine Singular**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion		x1	A tie!
	Impoverishment	x1		
Max. Expression	Case Features	0	1	DAT (more features expressed)

In terms of Least Effort, dative and accusative tie—they each require one mechanism, and thus the same amount of work. But in terms of Maximum Expression, dative wins, because in the dative one feature is expressed and in the accusative none are expressed. This corresponds to the weak preference for dative. The results for all other Class B forms will be like this (although some special remarks will be required for feminine singulars; see below).

It is worth pausing at this point to discuss some subtle alternatives which would actually make a difference. First, we mentioned above that one alternative to impoverishment was to assume that instead of special deletion rules, zeros are inserted. However, if this were the case then accusative and dative should tie on Maximum Expression, because inserting a zero would still be expressing a feature, from a formal standpoint. It would only be the phonology that distinguished between phonological zeros and non-zeros. Second, one could try to get around this by saying that Maximum Expression is evaluated at phonology—that it is there where the zero/non-zero distinction makes a difference. But we will see below, in the case of syncretic neuter singulars, that this is not the case; phonologically-determined zeros do not count as non-expression, and therefore the idea that Maximum Expression is evaluated on the basis of phonological form is dubious. Third, we might

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[18]The vowel preceding the /r/ is usually thought to be epenthetic (Anderson 1969; Orešnik 1972; Rögnvaldsson 1981; Kiparsky 1984; Karvonen and Sherman 1998; Gibson and Ringen 2000; Jurgec 2011; Thráinsson 2017) (though see Orešnik 1978 and Ingason 2016 for a different view).

have thought that Maximum Expression would be about how many features are left behind—how many are not expressed. But this example shows that this is not right either. Accusative and dative leave the same number of features behind. The difference is that the dative expresses a feature with an explicit Vocabulary Item.

Before moving on to neuters, we would like to make one more broad point, which actually goes beyond the specific formal details. Notice that descriptively, the accusative masculine singular (in this case *hund*) is an unambiguously accusative form. At the surface, there is a sense in which there is no "lack of expression". Anyone learning Icelandic would learn that *hund* is the accusative form of 'dog', which occurs wherever accusatives occur. But even from a relatively theory-neutral descriptive standpoint, the way accusative is "expressed" in this case is through the absence of an affix: the accusative is formed by using just the stem, with no other morphology. Notice that this is different from the plural cases we saw earlier. There, we had different VIs for ACC and DAT, and that corresponds to the fact that there are distinct, overt affixes for accusative and dative in the plural. We illustrate this difference with the paradigm in (39).

(39)

hundur 'dog'

	MASC SG	MASC PL
NOM	hund + -r $\rightarrow$ *hundur*	hund + -a-r $\rightarrow$ *hundar*
ACC	hund + $\boxed{\textbf{-Ø}}$ $\rightarrow$ *hund*	hund + $\boxed{\textbf{-a}}$ $\rightarrow$ *hunda*
DAT	hund + -i $\rightarrow$ *hundi*	hund + -um $\rightarrow$ *hundum*

One broad claim that we are pursuing in this paper is that this actually matters, whether one adopts the formal details of our analysis or not.

We are now in a position to see why neuter is in Class B, regardless of whether it is singular or plural. Consider the paradigm in (40), and how it compares to (39):

(40)

borð 'table'

	NEUT SG	NEUT PL
NOM	borð + -Ø $\rightarrow$ *borð*	borð + -Ø $\rightarrow$ *borð*
ACC	borð + $\boxed{\textbf{-Ø}}$ $\rightarrow$ *borð*	borð + $\boxed{\textbf{-Ø}}$ $\rightarrow$ *borð*
DAT	borð + -i $\rightarrow$ *borði*	borð + -um $\rightarrow$ *borðum*

The first thing to notice is that like the masculine singular, the neuter singular accusative is not expressed by any overt affix, while the neuter singular dative is expressed by the same *-i* that we saw above. The second thing to notice is that unlike the masculine singular, the same thing holds in the plural: there is no overt affix in the accusative plural, while there is one in the dative plural. (This is in fact the same dative affix we see for dative plurals in all genders, regardless of noun class.) It turns out that the reason this holds is that there is a massive metasyncretism between nominative and accusative in the neuter throughout the language: Neuters ***never*** express the NOM/ACC distinction

morphologically, not for any noun or modifier, not in the singular and not in the plural.[19]

This brings us to the only new thing we need to derive the forms of neuters, namely Impoverishment Rule C, shown in (41).

(41) **Impoverishment Rule C**
$[\pm v, -n, -obl] \rightarrow \emptyset \, / \, \{[-masc, -fem]\}$ __

$\approx$ *'Delete all case features for nominative and accusative in the neuter'*

While the previous Impoverishment rules deleted only the $[-obl]$ feature, this rule deletes all the case features for neuters in the nominative and the accusative. From here, the neuter singular plays out essentially exactly like the masculine singular, except that the case features are completely gone. The processes that derive neuter forms are shown in (42). The "[]" in the Impoverishment row in (42) indicates that all the case features are deleted at this stage. This is to distinguish it from the dative column, which is blank because nothing happens (so all the features are retained).

(42)

borð 'table'	ACC	DAT
$[-pl], [-masc, -fem]$	$[-n, +v, -obl]$	$[-n, +v, +obl]$
Impoverishment (41)	[]	
Vocabulary Insertion (34)		$[-n, +v]$, *-i*
$\rightarrow$ Phonology	*borð*	*borð-i*

In the accusative column, since no case features are left after Impoverishment Rule C applies, no Vocabulary Items can be inserted, and the stem is sent to phonology on its own. In the dative, there is no impoverishment rule, so the same *-i* is inserted to realize the $[+obl]$ feature that we saw in masculine singulars. The morphology sends the stem plus the *-i* to phonology, where they are combined into a single phonological word.

The results of the competition are shown in (43).

(43) **Neuter Singular**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion		x1	A tie!
	Impoverishment	x1		
Max. Expression	Case Features	0	1	DAT (more features expressed)

Everything here pans out exactly like the masculine singular. The accusative's one rule of impoverishment is balanced out by the dative's one instance of Vocabulary Insertion, so it is a tie as far as Least Effort is concerned. And once again, dative beats accusative for Maximum Expression, so

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[19]It should be noted that this systematic syncretism goes back to Proto-Indo-European. We thank Finnur Ágúst Ingimundarson for discussing this with us.

the result is a weak preference for dative over accusative, and therefore the word order that results in the dative (namely v_{ACC} & v_{DAT}).

The neuter plural plays out the same way as well. The only difference is that more features are expressed in the dative, because the dative plural Vocabulary Item, which is the same one that we saw earlier, is a portmanteau form that expresses all case features in the plural.

(44)

borð 'table'	ACC	DAT
[+pl],[−masc,−fem]	[−n, +v, −obl]	[−n,+v,+obl]
Impoverishment (41)	[]	
Vocabulary Insertion (25)		*-um*
→ Phonology	*borð*	*borð-um*

The results of the competition are shown in (45).

(45) **Neuter Plural**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion		x1	A tie!
	Impoverishment	x1		
Max. Expression	Case Features	0	3	DAT (more features expressed)

This result looks exactly like the masculine and neuter singulars, except that in the dative, three features are expressed. Here again, if we are choosing between accusative and dative, we are choosing between not doing VI in the accusative and doing VI in the dative.

We will once again pause to reflect on some subtle aspects of this result. First, notice that there is no advantage to expressing three case features in the neuter plural versus one case feature in the neuter singular. All that matters is that the dative beats the accusative in both singular and plural. Second, notice that even though the plural dative is the same in all genders—it is even expressed with the same Vocabulary Item in all cases—and it always expresses more features than the accusative, in the neuter it ties on Least Effort. This makes the preference for dative weaker in the neuter than in the masculine or feminine. This is the result we alluded to above that shows that neither Least Effort nor Maximum Expression is enough on its own. If we only considered Least Effort, then the Class B cases would show no preference for v_{ACC} & v_{DAT} order; they would be just like the Class A syncretic cases. So the amount of expression matters. But if we *only* considered Maximum Expression, we would not expect a difference between Neuter Plurals, on the one hand, and Masculine/Feminine Plurals on the other hand. All three win on Maximum Expression in the same way. What makes Masculine/Feminine Plurals favor dative so strongly is that they also win on Least Effort.

Before turning to syncretic feminine singulars, we would like to say just a few things about non-syncretic feminine singulars. In fact, it turns out that according to the system that we are adopt-

ing from Müller (2005), there should not even be any non-syncretic feminine singulars. We will see below that this is because there is an impoverishment rule that deletes the [±obl] feature in feminine singular for all cases other than the genitive. This derives a language-wide meta-syncretism to the effect that accusative and dative are always syncretic in feminine singular nouns.

However, while bare feminine singular nouns themselves never make an accusative/dative distinction, the suffixed definite article does. Modifiers like adjectives, etc., do as well, but we will focus on the definite suffix here because most of our non-syncretic examples are due to the definite suffix, and the morphology of other modifiers is nearly identical, so it is most likely possible to extend the same analysis to them. Müller (2005) did not have a proposal for non-syncretic feminine singular nouns, because Müller (2005) was focused entirely on the inflectional system of the bare nouns themselves, not the modifiers and definite suffixes that may occur with those nouns.

The table in (46) shows what the forms for the definite suffix are in the feminine singular.

(46)

	tungan 'the tongue' FEM SG

	STEM + CASE + DEF + case → *final form*
NOM	tung + -a + -n + Ø → *tungan*
ACC	tung + -u + -n + -a → *tunguna*
DAT	tung + -u + -n + -ni → *tungunni*

Since Müller (2005) does not make a concrete proposal for the morphology of adjectival modifiers and definite suffixes, we will draw from Sauerland (1996). As Müller (2005) notes, while Sauerland's overall approach is couched within Distributed Morphology, it is somewhat different in important respects, and reconciling that with the Müller 2005 system is not a trivial matter. However, it is for our purposes sufficient to note that Sauerland (1996) proposes that the accusative *-a* actually realizes a singular number feature, rather than any case feature. (This does not show up in the nominative because of an impoverishment rule that we will not discuss here.) The dative form *-ni*, however, is argued by Sauerland (1996) to realize the dative case, feminine gender, and singular features. Translating this analysis into the present feature system, we would have the Vocabulary Items in (47).[20]

(47) a. /a/ ↔ {[D],[−pl]}
      b. /ni/ ↔ {[D],[−pl],[+fem],[+obl]}

According to this analysis, both dative and accusative are subject to Vocabulary Insertion, so they tie on Least Effort, but the dative expresses more case features, so dative wins on Maximum Ex-

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[20]Sauerland (1996) uses the feature DAT for dative, so we could translate that into [−n,+v,+obl] in (47b). However, as far as we can tell, sticking with [+obl] is sufficient for our purposes, and brings the analysis closer to the analysis of other dative singulars, which also contain an *-i*.

pression. Thus, dative is weakly favored over accusative in these cases, just like with other Class B cases discussed in this section.[21]

6 Syncretism Effects: Feminine Singulars

We now turning to the remaining class, Class A, and focus on syncretic feminine singulars. We can now see more precisely why syncretism leads to no preference for conjunct order.[22] In (48), we repeat the corpus results from (14) above, and in (49) we show a sample paradigm.

(48)

	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
Feminine Singular Syncretic	64	50%	64	50%	128

(49)

	tunga 'tongue'
	FEM SG
NOM	tung + -a $\rightarrow$ *tunga*
ACC	tung + $\boxed{\text{-u}}$ $\rightarrow$ *tungu*
DAT	tung + $\boxed{\text{-u}}$ $\rightarrow$ *tungu*

To derive the forms of feminine singulars, we use the Vocabulary Items in (50) and (51), and Impoverishment Rule B, shown in (52).

(50) **Weak Elsewhere Suffix**
/a/ $\leftrightarrow$ {[$-$pl],[+weak]}

(51) **Feminine Weak Non-Nominative**
/u/ $\leftrightarrow$ {[$-$pl],[+weak,+fem],[+v]}

(52) **Impoverishment Rule B**
[$\pm$obl] $\rightarrow$ $\emptyset$ / {[$-$pl],[+fem],[$-$n]} __

$\approx$ *'Delete [$\pm$obl] in feminine singulars (for every case but genitive)'*

Consider in (53) how these rules derive the surface forms if we are doing Vocabulary Insertion

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[21]This once again illustrates the importance of a precise formal analysis, because if the *-a* were analyzed as expressing an accusative case feature, then the two would tie on maximum expression as well. The details matter. However, we should point out at least one other way of looking at the data, which would be to say that the accusative case feature is deleted by impoverishment, and the *-a* suffix does not count for 'Least Effort' because it does not realize a case feature. This would derive the same result. What would not work would be to assume that impoverishment applies and the insertion of *-a* counts as work, because then there would be two mechanisms for accusative and one for dative. As mentioned above, however, the present analysis can only be a sketch at the moment, because incorporating the inflection of modifiers and definite suffixes into Müller's system, while sticking to the methodological principles that led him to that analysis, is a non-trivial task that must be left for a future study.

[22]We skip masculine singular syncretic nouns for now, because there weren't enough in our sample; but the few examples that we do have go in the same direction. See the Appendix for further discussion of syncretic masculine singulars.

for either ACC or DAT.[23] Impoverishment Rule B applies, regardless of whether the [±obl] feature is [+obl] or [−obl]. The result is that the feature bundle is exactly the same for accusative and dative. From that point on, anything that would happen to one would happen to the other. In this case, the Vocabulary Item in (51) applies in either case, realizing the [+v] feature as *-u*.[24]

(53)

	ACC	DAT
{[−pl],[+weak,+fem]}	[−n, +v, −obl]	[−n,+v,+obl]
Impoverishment (52)	[−n, +v]	[−n,+v]
Vocabulary Insertion (51)	[−n], *-u*	[−n], *-u*
→ Phonology	*tung-u*	*tung-u*

Because of the impoverishment rule, there is no distinction between ACC and DAT at spellout—the same thing happens no matter which case was assigned, because the feature bundles are the same. Correspondingly, there is no ordering preference, as we saw above. Since the same thing happens in both cases, there is no difference between them in terms of Least Effort, and for the same reason, there is no difference between them in terms of Maximum Expression either. We will see next that this manner of deriving syncretism is what matters, not the mere fact that the forms end up being the same.

7 Neuter Singular Syncretic

Earlier we briefly mentioned a somewhat surprising fact about Class B: it includes syncretic neuters, despite the fact that the broader pattern has been that syncretic forms show no preference for v_{ACC} & v_{DAT} or v_{DAT} & v_{ACC}. That is, syncretism does not seem to make a difference in the neuter singular: there is a weak preference for v_{ACC} & v_{DAT} either way.

(54) (Non)Syncretic Neuter Objects

	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
Neuter Singular Syncretic	34	59%	24	41%	58
Neuter Singular Non-Syncretic	44	59%	31	41%	75

Strikingly, however, all the syncretic neuters in our corpus data come from Class 2, an inflection class that is normally not syncretic. We repeat the inflection class table from (21) in (55).

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[23]Here we illustrate with the [+weak] class, because the [−weak] classes are slightly more complicated and harder to visualize (since there are more zeros), and the result is the same (since Impoverishment applies regardless).

[24]While the *-u* is inserted for all non-nominative weak singulars, the leftover *-a* suffix is inserted as a general suffix for [+weak] nouns whenever nothing more specific applies. We do not show its derivation here because we are focused on accusative and dative, but we show the VI to make it clear how the nominative form would be derived in the paradigm in (49).

(55) Icelandic Inflection Classes   (Müller 2005:235)

	1 Ma	2 Na	3 Fa(′)	4 Mi	5 Fi	6 Mu	7 Mc	8 Fc1	9 Fc2	10 Mw	11 Nw	12 Fw
nom sg	ur	Ø	Ø	ur	Ø	ur	ur	Ø	Ø	i	a	a
acc sg	Ø	Ø	Ø (u)	Ø	Ø	Ø	Ø	Ø	Ø	a	a	u
dat sg	i	i	Ø (u)	Ø	Ø	i	i	Ø	Ø	a	a	u
gen sg	s	s	ar	ar	ar	ar	ar	ar	ur	a	a	u
nom pl	ar	Ø	ar	ir	ir	ir	ur	ur	ur	ar	u	ur
acc pl	a	Ø	ar	i	ir	i	ur	ur	ur	a	u	ur
dat pl	um	um	um	um	um	um	um	um	um	um	um	um
gen pl	a	a	a	a	a	a	a	a	a	a	(n)a	(n)a

In fact, we did not have any examples of the only other class of neuters, Class 11, where there is a systematic syncretism that we discuss further in the appendix. The reason that the Class 2 neuters in question are syncretic appears to be phonological. As we can see in (55), and as we saw above for both masculine and neuter singulars, the expected suffix is *-i* (IPA = [ɪ]). In the syncretic cases in question, all the stems end in /i/ (IPA = [ɪ]).[25]

Just the fact that this group can be characterized phonologically suggests that we are not dealing with feature-based syncretism. But beyond that, it is independently known that vowel deletion applies in Icelandic when two unstressed vowels appear next to each other (see, for example, Dehé 2008). In fact, we see this kind of deletion elsewhere in the same paradigm. Consider the paradigm for *epli* 'apple' in (56).

(56)

	epli 'apple'	
	NEUT SG	NEUT PL
NOM	epli	epli
ACC	**epli**	**epli**
DAT	**epli_**	**eplum**

In the plural column, we see that the dative plural suffix *-um* triggers deletion of the /i/ in the stem. Similarly, we can now see that the expected suffix *-i* triggers deletion of the /i/ in the stem—which looks like syncretism, but is derived in the phonology, not in the feature system. We can illustrate this by comparing a decomposed paradigm for *borð* 'table' in (57) with a similar one for *epli* 'apple'

[25]There is one exception to this, where the stem ends in *é* (IPA = [jɛ]); we do not take a stand on whether this example is phonologically-based or not.

in (58).

(57)

		borð 'table'		
		NEUT SG	NEUT PL	
NOM		borð + -Ø → *borð*	borð + -Ø → *borð*	
ACC		borð + -Ø → *borð*	borð + -Ø → *borð*	
DAT		borð + -i → *borði*	borð + -um → *borðum*	

(58)

		epli 'apple'		
		NEUT SG	NEUT PL	
NOM		epli + -Ø → *epli*	epli + -Ø → *epli*	
ACC		epli + -Ø → *epli*	epli + -Ø → *epli*	
DAT		epli + -i → *epli*	epli + -um → *eplum*	

Both nouns are in the same inflection class, with the same gender, and take the same affixes. But since *borð* 'table' ends in /ð/, adding *-i* in the dative leads to a dative form *borði* which is phonologically distinct from the accusative form *borð* (which is just the stem). Since *epli* 'apple' ends in /i/, adding *-i* in the dative leads to vowel deletion, and therefore a dative form *epli* which is phonologically identical to the accusative form *epli*, which is also, as above, just the stem.

What is stunning is that from the perspective of the v_{DAT}-final preference, the fact that the phonology provides an identical form does not seem to matter. The neuter singular syncretic examples do not behave like they are syncretic because from the perspective of the pre-phonological spellout system, they are not. The apparent syncretism is phonological. Therefore, in the current approach, we expect them to pattern like the other "weak preference" examples, as they in fact do. We illustrate this by showing the mechanisms that derive the input to phonology in (59).[26]

(59)

	ACC	DAT
[−pl],[−masc,−fem]	[−n, +v, −obl]	[−n,+v,+obl]
Impoverishment (41)	[]	
Vocabulary Insertion (34)		[−n, +v], *-i*
→ Phonology	*epli*	*epli-i*

Once again, we see that (60) looks exactly like the other neuter singular and masculine singular scoreboards, and thus a weak preference for dative and the v_{ACC} & v_{DAT} word order that leads to dative.

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[26] As above, the "[]" indicates that all the case features have been deleted.

(60) **Neuter Singular**

		ACC	DAT	Winner
Least Effort	Vocab. Insertion		x1	A tie!
	Impoverishment	x1		
Max. Expression	Case Features	0	1	DAT (more features expressed)

The lack of a syncretism effect with neuter singular shows that the morphosyntactic factors that affect the word order choice are quite abstract—it is not just a matter of the surface form. This dovetails nicely with the discussion of zeros with accusative case. There we saw that even though spellout processes led to an unambiguous accusative surface form, these processes actually did not count as expressing case features in the relevant technical sense. Zeros in those cases were analyzed as the absence of Vocabulary Insertion, and thus the lack of feature expression. Here, we see that even though something ends up as zero, if the zero is derived in the phonology, then it doesn't count as non-expression. This result also suggests that the string-oriented phonological processes do not "count" for the Least Effort calculation; the Least Effort calculation has to do with the mechanisms that map morphosyntactic features to phonological features, but not the phonology itself.[27]

8 Conclusion

In Icelandic, a v_{DAT} can be coordinated with a v_{ACC}, and while many factors may influence whether the word order for a given example is v_{ACC} & v_{DAT} or v_{DAT} & v_{ACC}, these factors ultimately balance out in the end, as long as the object is morphosyntactically syncretic for accusative and dative. The syncretism in question must be morphosyntactic—based in the feature system and not the phonology. Syncretism that is based in the phonology, exemplified by Class 2 neuters with stems that end in /i/, patterns with non-syncretic classes.

When the object is not syncretic, the v_{ACC} & v_{DAT} word order is preferred to different degrees depending on how the non-syncretism is derived. If the accusative is not realized by an overt suffix, then the dative is weakly preferred. If the accusative is realized by an overt suffix that is just distinct from the dative, then the dative is strongly preferred.[28] We have characterized the effect of affixation vs. non-affixation as a consequence of a competition, driven by two principles: Least Effort and Maximum Expression. Neither is sufficient on their own, but together they accurately characterize when the v_{ACC} & v_{DAT} order is weakly or strongly preferred, and also account for the equalizing

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[27]This makes sense, if one considers how complex phonology can be; the present results are surprising enough on their own—it is very hard to imagine that word order choice would be affected by counting up every rule of palatalization, assimilation, segment deletion, lengthening/shortening, (pre)aspiration, etc., for accusative versus dative forms.

[28]Note that there are no classes where the accusative is realized by an overt suffix and the dative is not realized by an overt suffix.

effect of feature-based syncretism.

The results are quite striking, and our account of them depends on some non-trivial assumptions about how spellout works. The most important of these have to do with impoverishment and the realization of "zero affixes". It is crucial for our account that "elsewhere zeros" do not count as expressing a feature bundle. If they did, then there would never be any differences in terms of Maximum Expression. It is also important that Impoverishment exists as a mechanism (so it incurs a "Least Effort" cost), but that this mechanism is distinct from Vocabulary Insertion. If we adopted an account where Impoverishment is modeled as the insertion of a zero, then "Impoverishment" would have to count as expressing a feature. Even in our model, it would be possible to insert a zero, for example a specifically conditioned, non-elsewhere zero. In that case, the zero in question would incur a cost for Least Effort (since it would be an instance of Vocabulary Insertion) and it would count as expressing that feature.[29] If Impoverishment were simply Vocabulary Insertion of zeros, then every Impoverishment rule would count as expressing the feature that is "deleted". This is obviously not what we want: in our account, Impoverishment incurs a Least Effort cost, and then the feature is gone, and does not get expressed. This was an important part of our analysis of the difference between the weak v_{DAT}-final preference and the strong v_{DAT}-final preference.

Our focus of this study has been somewhat narrow, focusing specifically on accusative and dative, and specifically on verb-coordination. We have not commented on the syntax of such coordination, such as how it is that the final verb determines the case on the object, or whether the word-order preferences are somehow part of the grammar. We have simply shown how the effects can be grounded in specific formal spellout mechanisms that attend to fine-grained details of Icelandic morphology. We would like to conclude this paper with a call for further studies that likewise attend to such details. From the perspective of the formal system, syncretism is not one thing; it can arise in different ways, and we should expect that these different sources of syncretism will have different effects, if we know where to look. But even more striking, and far less frequently acknowledged or attended to, the lack of syncretism can also arise in different ways, and this too should be expected to have different effects, if we know where to look.

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[29]Thanks to Karlos Arregi for bringing up this point.

Appendix: Some Further Nuances

In the main text we stuck to the most frequent and basic illustrative cases. There are many nuances in the Icelandic inflection system which might make different predictions if we had a larger dataset. Here we discuss a few of those nuances and what they mean for the present system.

Beginning with neuters, we noted above that we do not have any examples in our corpus of Class 11 neuter nouns being used as objects of coordinated verbs that assign distinct cases, as this class is quite small.[30] We would expect Class 11 neuters, which are [+weak], to behave the same as the other neuters in the plural. The impoverishment rule still deletes all the case features in the nominative and the accusative. But as a [+weak] noun, the weak suffix *-u* is inserted in the nominative and accusative. The singular, however, is distinct from the Class 2 neuters discussed in the main text. Recall that with Class 2 neuters, there was expected to be no syncretism in the singular, and the existing syncretic cases turned out to be phonologically based. In the singular of Class 11, however, the syncretism is systematic and featural. All the case features are deleted in the nominative and accusative, and the [±obl] feature is deleted in the dative and genitive, leaving them as [−n+v] for dative and [+n+v] for genitive. Nevertheless, Vocabulary Insertion is not specified for any of this, and no case features are realized. The [+weak] feature is realized with the elsewhere singular weak affix *-a*, by the Vocabulary Item in (61).

(61)   /a/ ↔ {[−pl],[+weak]}

We would therefore expect that unlike with the phonologically derived Class 2 neuters, this syncretism would lead to no word order preference: dative and accusative have the same number of Impoverishment and Vocabulary Insertion operations, and in neither case are any case features expressed.

We noted in the main text that we had very few examples of masculine singulars that were syncretic, and that in general the few examples we did have went in the same direction as the feminine singular syncretic examples. The classes where we would expect syncretism are Class 4 and Class 10. Class 4 is somewhat rare, and we only found 3 potential examples in our corpus.[31]

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[30]The most common examples are body parts such as *auga* 'eye' and *hjarta* 'heart'. Thomson (1987) lists only 16 words in this group, and 3 are marked as archaic. Sigurðsson (2005:40) lists 12 words in this group. Svavarsdóttir (1993:112) reports that only 1% of neuter nouns in a dictionary study are in this class.

[31]In fact, we say 'potential' because two of the three examples are not clearly class 4. One example is *hafa bölvað og bannfært bátagjaldeyri* 'have cursed and condemned the boat currency system (special currency system for fishermen)', where the syncretism on *bátagjaldeyri* 'boat currency system' is potentially due to phonology, for the same reason as the neuters with stems that end in /i/. It is not clear if this word should be treated as Class 1, with phonological syncretism, or Class 4, with syncretism due to underspecification. The second example is *breyta og bæta hag* 'change and improve circumstance', which more clearly shows the Class 4 type syncretism, although the genitive singular suffix for that word is *-s* rather than the *-ar* that would be expected of that class. The third is *efla og viðhalda búskap* 'strengthen and maintain agriculture', where *búskapur* 'agriculture' is the clearest Class 4 example that we have.

The dative/accusative syncretism in Class 4 is not derived by Impoverishment, but rather by underspecification and non-insertion. That is, the dative singular *-i* is specified to be inserted only for non-feminine singular nouns that are [−i-type]. Class 5 is [+i-type], but it doesn't matter because it is feminine, and Class 4 is [+i-type], so the *-i* is not inserted there. There are no [+i-type] neuter nouns. The result is that no accusative morpheme is inserted, just like the other strong neuter and masculine singular cases, but no dative morpheme is inserted either. In the present system, we would expect Impoverishment to apply in the accusative, but no Vocabulary Insertion to apply in either case. So in this case, dative would win on Least Effort, but accusative and dative would tie on Maximum Expression—since neither expresses anything. Given the reasoning in the present study, this would lead us to expect a weak preference for dative final order, but for a slightly different reason from the weak preference cases we have seen. We would need more examples of verb coordination sharing Class 4 objects to see if this prediction is borne out.

Class 10, the other class that would contain syncretic singular masculine nouns, is the class for weak masculine nouns. The accusative/dative syncretism in this class is featural, and due to Impoverishment Rule D:

(62) **Impoverishment Rule D**
      [±obl] → Ø / {[−pl],[+weak]} __
      ≈ *'Delete [±obl] for singular weak nouns'*

We would therefore expect no word order preference. As it is, we have only 6 examples in our corpus results, and they are evenly split, with 3 taking the order v_{ACC} & v_{DAT} and 3 taking the order v_{DAT} & v_{ACC}.[32] This is of course what we expect, although with such a small number of examples, it could just as easily be an accident.

The main text illustrated feminine syncretism with Class 12 weak feminine nouns. Most of the strong classes have no suffixes in the singular nominative, accusative or dative, so there is no Vocabulary Insertion. The same reasoning in the main text applies to them, however; we expect no asymmetries in word order because there is an Impoverishment rule applied in all cases, and then, for the strong feminine nouns, that is all that happens, regardless of whether they are accusative or dative. And indeed, the choice of word order is fairly even within each noun class, as shown in the table in (63).

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[32]Note that Svavarsdóttir (1993:108) reports that around 37% of masculine nouns fall into this group, so with 122 masculine nouns in our results, it may seem surprising that we do not have more examples. In fact, we have 19 other examples of Class 10 nouns, to make a total of 25; it's just that these 19 examples are not syncretic; 12 are not syncretic because they are plural, and 7 are not syncretic for other reasons, such as the definite suffix or (in one case) a possessive modifier.

(63)

Noun Class	v_{ACC} & v_{DAT}		v_{DAT} & v_{ACC}		Total
3	10	56%	8	44%	18
5	22	52%	20	48%	42
9	0	0%	1	100%	1
12	26	50%	26	50%	52
Other	6	40%	9	60%	15

The clear exception is the examples that fall into the "other" category; these are nouns that do not fit clearly into any of the common noun classes. In fact, they have no suffixes in the singular at all for any case, including genitive, and they all end in /i/. In traditional grammar these are referred to as "indeclinable" words. There is no particular reason in the context of the present study that they should show the asymmetry that we seem to find, which is weakly in favor of accusative-final order. At this level of granularity, with the number of examples so small, we will assume it is an accident. With 15 examples in this class, we would expect roughly 7 or 8 to fall into each order. Instead, we have 9 in the v_{DAT} & v_{ACC} order, which is just one item away from what we would expect.

The other feminine class that warrants some comment is class 3, which in our case consists entirely of what Müller referred to as class 3′. This is the only strong feminine class where there is Vocabulary Insertion for the accusative and dative singular, although the syncretism still does hold. The suffix *-u* is used for both accusative and dative, which is accounted for by Müller with the highly specified Vocabulary Item shown in (64):[33]

(64)   /u/$_3$ ↔ {[−pl],[−weak,+fem,+a'-type],[−n+v]}

The derivation for these feminine nouns would be different from the others, because the case features would actually be expressed. But there still would not be a relevant difference between accusative and dative. Impoverishment Rule B would still delete the [±obl] feature in the nominative, accusative and dative. The Vocabulary Item in (64) would realize the remaining case features, which would be identical for accusative and dative. There would thus be no difference between the two: both would involve Impoverishment and Vocabulary Insertion, and the same number of case features are expressed. We would therefore expect no particular case preference, all else being equal, and the results we find are close enough to that to not raise any special doubts. The details are different, but the results and conclusions we draw from them are the same.

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[33]The numerical subscript is meant to indicate that this is a different /u/ from the /u/ that is inserted for other Vocabulary Items, much as most linguists would assume that the 3rd singular *-s* in English is a different *-s* from the plural *-s*.

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