

JAMES P. BLEVINS (Cambridge)

DECLENSION CLASSES IN ESTONIAN*

Abstract. Although the declensional system of Estonian exhibits considerable inflectional variation, nominals can be assigned to a small number of classes based on implicational relations between principal parts and inflectional patterns. The shape of the partitive singular and the prosodic structure of the genitive singular are of particular value in identifying class. Given that the other forms of a paradigm are transparently related to these principal parts, most forms of a nominal identify at least one principal part and the other forms that are also based on it. In addition to the symmetry of its implicational structure, the declensional system is distinguished by the role of 'pure' morphological patterns. Classes are cued by variation in form, without evident syntactic or semantic correlates, so that recognizing the class of an item just identifies other forms of the item.

Keywords: Estonian, declension classes, gradation, WP morphology.

1. Introduction

The Estonian declensional system is renowned for the number of case forms and inflectional patterns that it contains. However, the organization of the system is in some ways more striking than the sheer number of forms or patterns. Unlike their Indo-European counterparts, declension classes in Estonian are not cued by gender (or, indeed, by any obvious syntactic or semantic property), and they are not, for the most part, marked by distinctive affixal variation. Instead, the inflectional patterns that divide paradigms into classes correlate most closely with the shape and prosodic structure of one or more diagnostic case forms. The pivotal role of these 'principal parts' is recognized in traditional descriptions, which tend to distinguish three basic forms: the nominative, genitive and partitive singular (though the class of many nouns can be identified from the genitive or partitive singular alone). The use of diagnostic principal parts to identify the class of an item exploits the

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interpredictability of forms within an paradigm, as in other inflectional systems. What distinguishes the Estonian system is the robustness and symmetry of this implicational structure. The traditional treatment of the genitive and partitive singular forms as basic is motivated by the fact that their shape or prosody function as primary cues of class affiliation. Moreover, the remaining forms of a nominal are transparently related to the genitive or partitive singular. Hence, genitive or partitive singular forms can be deduced from just about any form of a noun, with the result that almost any case form identifies one of the class-defining principal parts.

Given these systematic interdependencies, the distinctive structure of the Estonian declensional system cannot be represented in terms of a static taxonomy of classes and subtypes that classifies isolated properties, but must also take into account relations between interpredictable patterns. Section 2 below illustrates how a 'word and paradigm' (WP) perspective (Matthews 1991; Blevins 2006) captures the critical interdependency between properties of basic forms and inflectional patterns. Over the declensional system as a whole, variation often carries a 'purely morphological' signal that identifies other forms of an item, a type of pattern that is particularly compatible with implicational models such as Wurzel 1970, Bochner 1993, Bonami, Boyé 2007, Finkel, Stump 2007 and Ackerman, Blevins, Malouf (in press). Section 3 outlines how this type of description can provide the basis of a comprehensive description. Section 4 concludes with some general issues relating to paradigm structure. These include the role of paradigmatic conditioning, the organization of forms into 'cohort sets' and the status of paradigm uniformity.

2. The organization of the Estonian declensional system

It is traditional to organize the Estonian declensional system into a set of major declension classes, which are further subdivided into minor 'word types'. For example, EKK (Erelt, Erelt, Ross 2000 : 240f.) distinguish seven basic declensions (*käändkonnad*), comprising 22 open-class types (*avatud tüübid*) and another 23 closed-class types (*suletud tüübid*). Other descriptions, such as EKG I (Erelt, Kasik, Metslang, Rajandi, Ross, Saari, Tael, Vare 1995), Viks 1992 and ÕS (Eesti keele sõnaraamat ÕS 2006), arrive at a slightly different breakdown of classes and subtypes. However, much of the apparent variation across descriptions reflects the lack of secure criteria for distinguishing top-level 'classes' from 'subtypes', and it is unclear that there is ultimately a principled basis for this distinction. Instead, a more revealing picture of the dynamic structure of this system can be obtained by describing the distinct inflectional patterns and their interrelations. From this perspective, the declensional system is not organized into sets of concentric classes and types, but forms networks of interdependent patterns. At one extreme are highly general patterns, which predict the variation in form inventories and paradigm structure that defines traditional declension classes. At the other extreme are idiosyncratic patterns, which characterize small subclasses or even individual items. Between these extremes lie patterns that characterize subtypes or cut across classes.

2.1. Prosodic and implicational structure

Over the declensional system as a whole, two contrasts stand out as being of particular predictive, and, hence, classificatory value. The first contrast is inflectional, and distinguishes nominals whose partitive singular ends in a vowel from nominals whose partitive singular ends in *-t* or *-d*. This contrast sets off the first declension from the other classes. The second contrast is prosodic, and distinguishes nominals whose genitive singular form ends in a light trochee from nominals whose genitive singular exhibits a non-trochaic pattern. This contrast distinguishes one closed subtype of the first declension, and partitions the more heterogeneous group of nominals with consonant-final partitives into the subclasses in table 1.

Table 1

Classification of basic case forms		
Genitive Sg		
Partitive Sg	Trochaic	Non-Trochaic
Vocalic	I	I
Consonantal	III	II

Each of the classes in table 1 correlates with distinctive inflectional patterns or form inventories, which are partially illustrated in table 2.¹ Class I is associated with 'short' illative singular forms (ILLA2) and 'stem' partitive plurals (PART2), and contains all nominals that exhibit productive 'quantitative' gradation in modern Estonian. Class II nominals have distinctive genitive plurals in *-te*, partitive plurals in *-id* and an alternative series of plural forms based on a stem in *-i*. Class III nominals likewise have partitive plurals in *-i* and distinctive illative singulars.

Table 2

Exemplary grammatical case forms (ÕS 2006)									
		I		II		III			
		Sg	Pl	Sg	Pl	Sg	Pl	Sg	Pl
Nom		<i>maja</i>	<i>majad</i>	<i>lipp</i>	<i>lipud</i>	<i>kirik</i>	<i>kirikud</i>	<i>inimene</i>	<i>inimesed</i>
Gen		<i>maja</i>	<i>majade</i>	<i>lipu</i>	<i>lippude</i>	<i>kiriku</i>	<i>kirikute</i>	<i>inimese</i>	<i>inimeste</i>
Part		<i>maja</i>	<i>majasid</i>	<i>lippu</i>	<i>lippusid</i>	<i>kirikut</i>	<i>kirikuid</i>	<i>inimest</i>	–
Ill2/Part2		<i>majja</i>	<i>maju</i>	<i>lippu</i>	<i>lippe</i>	–	–	<i>ini`messe</i>	<i>inimesi</i>
		'house' (3)		'flag' (20)		'church' (12)		'person' (12)	

The classes in tables 1 and 2 can also be broken down into identifiable subtypes, though the contrasts that define these subtypes do not correlate with patterns of comparable generality and so are of limited value in cross-classifying the members of other classes. The subtypes of the first declension include nominals like LIPP 'flag', which exhibit productive gradation, along with nominals like MAJA 'house', which do not exhibit gradation. So one could justifiably assign LIPP and MAJA to different classes, as in many descriptions. However, one cannot treat gradation as a general

¹ The numbers in parentheses in table 1 and following tables represent the classes in ÕS 2006. Following Ülle Viks (1992), the initial grave accent in forms such as *lippu* marks an 'overheavy' Q3 syllable.

class-defining property for nominals — as it is for verbs (Blevins 2007) — given that productive gradation is confined to the first declension. Second declension nominals fall similarly into a number of prosodically-definable subtypes, including monosyllabic nominals such as PUU 'tree', iambic nominals such as TROFEE 'trophy' and nominals such as KIRIK 'church' with dactylic genitive singulars like *kiriku*. Yet these subclasses plainly have no relevance for the trochaic first and third declensions. The class of nominals that combine a trochaic genitive singular and a consonant-final partitive singular can likewise be divided into third declension nominals like INIMENE 'person' with a consonant-final stem, as in *inimest*, and 'fourth declension' nominals like KÕNE 'speech' with a vowel-final stem, as in *kõnet*.

An implicational perspective thus helps to distinguish three types of properties. General properties, such as prosodic structure, partition the declensional system and predict aspects of a nominal's paradigm. Specific properties, such as grade alternations, characterize a narrower class of nominals but are of predictive value for the nominals to which they apply. Either type of property can be taken to define declension 'classes', given that little of consequence hinges on the distinction between classes and subtypes. There is also a third type of property, which subdivides nominals but does not imply any properties in addition to those that provide the basis for the original division. For example, some first declension nouns have a stem partitive plural, as illustrated by *maju* in table 2. Other nouns lack this form, as in the case of KÜLA 'village' in table 6. There is plainly no point in dividing the first declension into subtypes based on the presence or absence of short partitives, since the only property that distinguishes these subtypes is the one that is used to define them in the first place.² The second declension can be similarly subdivided on the basis of syllable count, but this contrast is again essentially taxonomic.

Even more fundamental to an implicational analysis is the nature of the relation between patterns. In traditional descriptions, basic forms are often regarded as 'underlying' derived forms in the sense of providing a base from which the derived form is 'constructed'.³ In an implicational analysis, the central relation is predictability rather than derivability. Derivational relations can of course be treated as a limiting case of an implication, one in which forms stand in a part-whole relation. However, principal parts can also imply forms that they need not underlie in any derivational sense. For example, a vowel-final trochaic partitive singular in the strong grade implies, amongst other forms, a genitive singular in the weak grade and a weak nominative plural. Thus partitive singular *lippu* in table 2 implies genitive singular *lipu* and nominative plural *lipud*,

² This is not to say that there is no pedagogical value in subdividing class I nominals, but only that subclasses add no information to a description that merely lists stem partitive plurals.

³ This implicitly derivational perspective sometimes leads to the identification of 'minimal' forms as basic. In most Estonian declensions, the nominative singular is segmentally minimal, though this form is not basic, in that the presence or absence of a final vowel is usually predictable from the prosodic structure of the partitive or genitive singular, as discussed in section 3 below.

though neither of these forms need be regarded as 'derived' from the partitive singular. Unlike derivation, prediction also need not be unique. The genitive plural form *kirikute* 'churches' is predictable from the genitive singular *kiriku* or from the partitive singular *kirikut*, leading some accounts to identify the base as the genitive singular (Mürk 1997) and others as the partitive singular (Tuldava 1994; EKG I 1995). From an implicational perspective, there is no need for a forced choice in this case; a dactylic genitive singular or partitive singular in *-t* are both equally good predictors of the genitive plural.

Unlike derivational relations, implicational patterns are often symmetrical, and this symmetry is relevant to the analysis of 'analogical' non-basic forms. The eleven 'semantic' case forms of an Estonian nominal (illative, inessive, elative, allative, adessive, ablative, translative, terminative, essive, abessive and comitative) are all based on the corresponding genitives, as illustrated in table 3. Hence, the genitive singular directly implies the shape of the eleven semantic case forms. Conversely, given that semantic case endings are invariant in Estonian, the eleven semantic case forms also directly imply the shape of the genitive singular, and thereby identify the class of many nominals. The genitive plural form likewise implies — and is implied by — the plural semantic case forms. In addition, the genitive plural reliably predicts the form of the partitive singular. The effect of these relations is that any semantic case form identifies at least one of the diagnostic basic forms.

Table 3

	Analogical structure of semantic case forms					
	I		II		III	
	Sg	Pl	Sg	Pl	Sg	Pl
Gen	<i>lipu</i>	<i>\lippude</i>	<i>kiriku</i>	<i>kirikute</i>	<i>inimese</i>	<i>inimeste</i>
Illa	<i>lipusse</i>	<i>\lippudesse</i>	<i>kirikusse</i>	<i>kirikutesse</i>	<i>inimesesse</i>	<i>inimestesse</i>
Ines	<i>lipus</i>	<i>\lippudes</i>	<i>kirikus</i>	<i>kirikutes</i>	<i>inimeses</i>	<i>inimestes</i>
Ela	<i>lipust</i>	<i>\lippudest</i>	<i>kirikust</i>	<i>kirikutest</i>	<i>inimesest</i>	<i>inimestest</i>
Alla	<i>lipule</i>	<i>\lippudele</i>	<i>kirikule</i>	<i>kirikutele</i>	<i>inimesele</i>	<i>inimestele</i>
Ades	<i>lipul</i>	<i>\lippudel</i>	<i>kirikul</i>	<i>kirikutel</i>	<i>inimesel</i>	<i>inimestel</i>
Abla	<i>lipult</i>	<i>\lippudelt</i>	<i>kirikult</i>	<i>kirikutelt</i>	<i>inimeselt</i>	<i>inimestelt</i>
Trans	<i>lipuks</i>	<i>\lippudeks</i>	<i>kirikuks</i>	<i>kirikuteks</i>	<i>inimeseks</i>	<i>inimesteks</i>
Term	<i>lipuni</i>	<i>\lippudeni</i>	<i>kirikuni</i>	<i>kirikuteni</i>	<i>inimeseni</i>	<i>inimesteni</i>
Ess	<i>lipuna</i>	<i>\lippudena</i>	<i>kirikuna</i>	<i>kirikutena</i>	<i>inimesena</i>	<i>inimestena</i>
Abes	<i>liputa</i>	<i>\lippudeta</i>	<i>kirikuta</i>	<i>kirikuteta</i>	<i>inimeseta</i>	<i>inimesteta</i>
Com	<i>lipuga</i>	<i>\lippudega</i>	<i>kirikuga</i>	<i>kirikutega</i>	<i>inimesega</i>	<i>inimestega</i>
	'flag' (20)		'church' (12)		'person' (12)	

The exceptionless analogical patterns and invariant endings in table 3 entail that semantic case forms are completely determined by the principal parts of a nominal, so that variation within the declensional system is confined to the grammatical cases. Affixal variation is limited even within the grammatical cases, as only the partitive and the genitive plural endings in table 4 have multiple realizations, and even this variation is partly conditioned by metrical and phonological factors.

Table 4

Declensional endings in Estonian		
	Sg	Pl
Nom(inative)		-d
Gen(itive)		-de/-te
Part(itive)	-t/-d	-sid/-id/-i
Illa(itive)		-sse
Ines(sive)		-s
Ela(itive)		-st
Alla(itive)		-le
Ades(sive)		-l
Abla(itive)		-lt
Trans(lative)		-ks
Term(inative)		-ni
Ess(ive)		-na
Abes(sive)		-ta
Com(itative)		-ga

2.2. Metrical classes

The uniformity of inflectional endings is offset by variation in the shape and distribution of diagnostic stem forms, which largely define the class system.⁴ The diagnostic value of the genitive singular is illustrated by the exemplary declensions in table 2 and elaborated in section 3 below. As elsewhere in the morphological system, the distinctive prosodic contrasts are foot-based (Lehiste 1965; 1997), rather than syllable-based (Hint 1997), reflecting the fact that Estonian often continues to treat 'overlong' Q3 syllables as the disyllables from which they are historically derived. The role of foot structure is due to the way that the inflectional system of Estonian maps a three-way phonological contrast between the 'first quantity' (Q1), the 'second quantity' (Q2) and the 'third quantity' (Q3) onto a binary morphological split between *h e a v y* feet, which contain an initial Q3 syllable, and *l i g h t* feet, which contain an initial Q1 or Q2 syllable. Forms of distinct items may be distinguished by the contrast between an initial Q1 and Q2 syllable, as in the case of the Q1 genitive singular *koli* 'junk' and the Q2 genitive singulars *kooli* 'school' and *kolli* 'bugbear'. Forms of a single nominal may likewise be distinguished by a contrast between Q2 and Q3, as in the case of the opposition between Q2 *kooli* and the Q3 partitive singular *˘kooli*. Some nominals even exhibit a contrast between Q1 and Q3, as illustrated by the Q1 form *maja* and the Q3 short illative singular *˘majja* in table 2. However, the difference between an initial Q1 and Q2 syllable is never contrastive in the paradigm of any item. Hence a distinction between heavy (Q3) and light (Q1/Q2) metrical units isolates the morphologically relevant prosodic contrast.

⁴ One could say that declension classes in Estonian are defined more by patterns of 'stem syncretism' than by distinctive affixal variation. However, it must be borne in mind that most of these 'stems' function as full word forms and that patterns of syncretism hold between paradigm cells, and cannot be specified in terms of any substantive properties of stems.

Furthermore, as discussed by Ilse Lehiste (1997), the three syllable types have distinctive patterns of distribution. Q1 and Q2 syllables can only occur within larger prosodic feet, and Q1 syllables only as initial syllables of a foot. In contrast, Q3 syllables may either constitute independent feet or else occur as parts of larger feet. The dual role of Q3 syllables reflects the fact that the morphology sometimes treats Q3 syllables as heavy monosyllables and sometimes as disyllables. This ambiguity precludes a stable association between syllable count and noun class. Nouns that inflect alike may have a variable number of syllables, and nouns with the same syllable count may follow different inflectional patterns, depending on the prosodic organization of the syllables. Hence, the quantity contrasts that define the productive grade system directly enhance the diagnostic value of prosodic feet and words.

Although the primary prosodic cue for declension classes is the metrical structure of the genitive singular forms, classes can also be identified on the basis of relations between pairs of forms, particularly forms that show grade alternations. In paradigms that exhibit quantitative gradation, the strong grade is prosodically heavy and the weak grade is light. Weakening gradation, in which a strong nominative and partitive singular contrast with a weak genitive singular, is confined to the first declension. Strengthening gradation, in which a weak nominative and partitive singular contrast with a strong genitive singular, is confined to the second declension. Hence the contrast between *˘tool* or *˘tooli* and *tooli* in table 5 identifies TOOL as a first declension noun. The contrast between *mõte* and *˘mõtte* likewise marks MÕTE as belonging to the second declension. Furthermore, because plural grammatical case forms are based on singulars, the prosodic contrast between *toolid* and *˘toolide* also identifies TOOL as a first declension noun, while the contrast between *˘mõtted* and *mõtete* identifies MÕTE as a second declension noun.

Table 5

Quantitative grade contrasts in the first and second declension

	Weakening		Strengthening	
	Sg	Pl	Sg	Pl
Nom	<i>˘tool</i>	<i>toolid</i>	<i>mõte</i>	<i>˘mõtted</i>
Gen	<i>tooli</i>	<i>˘toolide</i>	<i>˘mõtte</i>	<i>mõtete</i>
Part	<i>˘tooli</i>	<i>˘toolisid</i>	<i>mõtet</i>	<i>˘mõtteid</i>
		'chair' (20)		'thought' (31)

The opposition between strong and weak singular forms thus bears more of a direct grammatical load within nominal paradigms than it does anywhere in the inflectional system. Although no verb paradigm contains minimal pairs that differ only in grade, a quantitative contrast is the sole property that distinguishes two pairs of forms in table 5. In the weakening paradigm of TOOL, the Q3 partitive singular *˘tooli* differs solely in grade from the Q2 genitive singular *tooli*. In the strengthening paradigm of MÕTE, the Q3 genitive singular *˘mõtte* contrasts similarly with the Q2 nominative singular *mõte*. Quantitative contrasts also play a role in the paradigms of first declension nouns that contain short illative singular forms. In the paradigm of a noun such as MAJA in table 2, an initial Q3 syllable distin-

guishes the short illative singular *˘majja* from the Q1 form *maja*. The opposition between Q3 and non-Q3 syllables is thus the only property that maintains the contrast between partitive and genitive forms of TOOL, between genitive and nominative forms of MÖTE, and which preserves a distinctive illative singular form of nouns like MAJA.

Although alternations between strong and weak forms provide a useful cue for nouns that exhibit gradation, this cue is too narrowly distributed to provide a classification of declensional classes or types in general, because the majority of nominal types do not exhibit gradation. The weakening pattern illustrated by TOOL characterizes at most a couple of productive noun types. EKK (2000 : 241) identify a few hundred nouns that preserve the strengthening pattern illustrated by MÖTE, but this pattern is no longer productive, and the paradigm structure and form inventories of the nouns that show strengthening gradation place them squarely within the second declension. Hence, gradation complements the class information cued by metrical structure, much like other class-specific patterns.

3. Declension classes

A number of general patterns are characteristic of all nominal paradigms. Genitive singular forms always end in a vowel, which is termed the 'theme vowel' below. In regular declensions, the same vowel occurs in the partitive singular and may be retained in the nominative singular, depending on prosodic and morphological factors that are set out in section 3.5 below. The choice of theme vowel is a lexical property of nominals and is not predictable from the phonological form or declension class of an item, though the vowel *-i* appears to have a default status, and tends to be associated with new loans. Although patterns of interdependency within the grammatical cases tend to be more class-specific, the nominative plural is always based on the genitive singular and the ending *-d*.

The declensions and subtypes set out provisionally below elaborate the basic classes in table 2. The two largest classes are the first declension, which contains nominals with vowel-final partitive singulars and the second declension, which contains nominals with consonant-final partitive singulars and non-trochaic genitive singulars. The third declension comprises a restricted subclass of nominals with consonant-final partitive singulars and trochaic genitive singulars. Third declension nominals have nominative singulars that end in *-us*, *-(l)ane*, *-(l)ine*, *-(m)ane* or *-(m)ine*, corresponding to genitive singulars that end in a foot *Cuse*, *Case* or *Cise* (where the C may either be a stem-final consonant or the onset of a derivational exponent). Estonian also contains assimilated loans of various kinds, which can either be treated as exceptional members of the classes in table 2, or else organized into a fourth declension with a minimal form inventory. This 'class' would be defined by the lack of gradation, the absence of fusional forms, and the concomitant use of 'default' exponents: the partitive *-t*, the genitive plural *-de* and the partitive plural *-sid*.

The following sections now examine the structure of each of these classes in turn.

3.1. The first declension

The defining characteristic of the first declension is a partitive singular ending in one of the theme vowels *a*, *e*, *i*, or *u*. This class can be divided into subtypes, based on stem inventories. In one subtype, illustrated in table 6, the paradigm of a nominal is based on a single stem, which realizes the partitive and genitive singular.

Table 6

Exemplary single-stem first declension nouns						
	Sg	Pl	Sg	Pl	Sg	Pl
Nom	<i>küla</i>	<i>külad</i>	<i>maja</i>	<i>majad</i>	<i>koridor</i>	<i>koridorid</i>
Gen	<i>küla</i>	<i>külade</i>	<i>maja</i>	<i>majade</i>	<i>koridori</i>	<i>koridoride</i>
Part	<i>küla</i>	<i>külasid</i>	<i>maja</i>	<i>majasid</i>	<i>koridori</i>	<i>koridorisid</i>
Ill2/Part2	<i>külla</i>	–	<i>majja</i>	<i>maju</i>	<i>koridori</i>	<i>koridore</i>
	'village' (3)		'flag' (3)		'corridor' (20)	

A second group, illustrated in table 7, contains nominals based on a pair of stems that contrast in morphological grade. In the quantitative pattern, the strong stem contains an initial Q3 syllable, as illustrated by TOOL in table 5 and LIPP in table 7. In the 'qualitative' pattern exhibited by SADU and RIDA, the strong stem contains a segment that is modified or lost in the corresponding weak forms. In all grade-alternating first declension paradigms, the strong stem realizes the partitive singular and the weak stem realizes the genitive singular, defining a 'weakening' pattern.

Table 7

Exemplary multiple-stem first declension nouns						
	Quantitative		Qualitative			
	Sg	Pl	Sg	Pl	Sg	Pl
Nom	<i>lipp</i>	<i>lipud</i>	<i>sadu</i>	<i>sajud</i>	<i>rida</i>	<i>read</i>
Gen	<i>lipu</i>	<i>lippude</i>	<i>saju</i>	<i>sadude</i>	<i>rea</i>	<i>ridade</i>
Part	<i>lippu</i>	<i>lippusid</i>	<i>sadu</i>	<i>sadusid</i>	<i>rida</i>	<i>ridasid</i>
Ill2/Part2	<i>lippu</i>	<i>lippe</i>	<i>sattu</i>	–	<i>ritta</i>	<i>ridu</i>
	'flag' (20)		'rain' (16)		'row' (16)	

A comparison of the paradigms in tables 6 and 7 highlights patterns that are strongly correlated with vowel-final partitive singulars and also identifies some significant points of variation. Each of the paradigms in tables 6 and 7 contains a 'short' illative singular (ILLA2), whose form is predictable from the partitive singular. Short illatives are subject to a prosodic requirement: they must be larger than the minimal prosodic foot in Estonian, i.e., larger than a heavy monosyllable or light disyllable. If the partitive singular of a nominal is larger than a prosodic foot, then the short illative is identical to the partitive singular. A heavy disyllable such as (*lip.pu*) satisfies this prosodic requirement, since the Q3 syllable *lip* qualifies as a foot. A light quadrisyllabic form such as (*ko.ri*).(do.ri) also qualifies, given that it consists of two light disyllabic feet, (*ko.ri*) and (*do.ri*). Hence the short illatives of LIPP and KORIDOR are identical to the partitive singular forms *lippu* and *koridori*. Light disyllabic partitive singulars are

not larger than the minimal prosodic foot, so these forms do not satisfy the prosodic requirement on short illatives. Instead, paradigms with light disyllabic partitive singulars have short illatives that are segmentally identical to the partitive singular but contain an initial Q3 syllable. Thus the light partitive singulars (*kü.la*), (*ma.ja*), (*sa.du*) and (*ri.da*) correspond to the short illatives (*˘kül.la*), (*˘maj.ja*), (*˘sat.tu*) and (*˘rit.ta*), which contain an initial Q3.

The second distinctive fusional forms in tables 7 and 8 are the 'stem' partitive plurals (PART2) *maju*, *koridore*, *˘lippe* and *ridu*. These forms again correspond to the partitive singulars *maja*, *koridori*, *˘lippu* and *rida*, though the correspondence is somewhat less regular in this case. The base of these partitive plurals preserves the stem of the partitive singular, while the final vowel is an 'exchange variant' of the theme vowel of a nominal. Some patterns, notably the alternation between theme vowel *-i* and partitive plural *-e*, are relatively predictable. Other alternations are less consistent. A partitive plural in *-u* is a common exchange variant of a partitive singular with the theme vowel *-a*, as illustrated by the pairs *maja* ~ *maju* and *rida* ~ *ridu*. However, partitive plurals with the theme vowel *-a* may correspond to stem partitive plurals with either of the other theme vowels: *-i*, as in *pesa* ~ *pesi* 'nest' and *keha* ~ *kehi* 'body' or *-e*, as in *muna* ~ *mune* 'egg'. More fundamentally, the presence of a stem partitive plural is not, in general, predictable. The fact that MAJA and RIDA have short partitive forms, while KÜLA and SADA lack these forms, just appears to be an irreducible difference in the form inventories of these individual items. The presence or absence of a stem partitive plural is not implied by any obvious properties of these items and does not predict any other variation in their paradigms.

The partitive singular also defines the stem of the genitive plural in *-de* and the partitive plural in *-sid*. This pattern is illustrated by the genitive/partitive pairs *˘lippude* ~ *˘lippusid*, *sadude* ~ *sadusid* and *ridade* ~ *ridasid*, which are based on the corresponding partitives *˘lippu*, *sadu* and *ridu*, not on the genitives *lipu*, *saju* and *˘rea*. Although most genitive plurals are based on the partitive singular, partitive plurals based on the partitive singular are a characteristic feature of the first declension.

In sum, a first declension nominal is not only identified by a vocalic partitive singular, but also by the forms that it predicts. In paradigms that exhibit qualitative gradation, the genitive plural in *-de* and the long partitive plural in *-sid* are also diagnostic, given that both forms are based on the partitive singular and a strong partitive plural must belong to the first declension. The diagnostic value of these forms is complemented by the metrical structure of genitive singular forms. In all productive first declension paradigms, the genitive singular ends in a light trochee. Disyllables may have an initial Q1 syllable, as in the case of (*ma.ja*), or they may contain an initial Q2 syllable, as in the case of (*lip.pu*). But they cannot contain an initial Q3 because disyllabic genitive singulars with an initial Q3 are confined to the second declension. No first declension disyllables have an initial Q3 through their paradigm, and the fact that the first declension exhibits only weakening gradation means that the genitive singular is always weak in first declension nouns that exhibit quantitative alternations. Initial Q3 syllables thus occur only in partitive singular

forms such as *lippu*, and alternate with Q2 syllables in the corresponding genitive *lipu*. In paradigms where qualitative gradation modifies an intervocalic segment, the weak genitive remains trochaic, as illustrated by partitive-genitive pairs such as *sadu* ~ *saju* 'rain', *sõda* ~ *sõja* 'war' or *tõbe* ~ *tõve* 'disease'. Although there are no monosyllabic nominals in the first declension, qualitative gradation can produce a weak monosyllabic genitive singular when an intervocalic segment is deleted altogether. In order to satisfy the minimal word constraint of Estonian, these monosyllables must be Q3, as illustrated by the genitive singular *rea* in table 7. The metrical structure of a Q3 form such as *rea* is non-trochaic, thus not diagnostic of the first declension, though both the genitive and partitive principal parts of nouns that exhibit qualitative gradation must generally be learned in any case.

As illustrated in table 7, the first declension contains morphologically simple nouns with quadrisyllabic genitive singulars in *-i*, such as *koridori*. These forms consist of two trochaic feet, as in *(kó.ri).(dò.ri)*, with main stress on the initial and alternating secondary stress on the third syllable. The first declension also contains various compound-like nominals with genitive singulars in *-iku*. Some of these nominals also have quadrisyllabic genitive singulars, as in the case of *tuleviku* 'future' and *lugemiku* 'reader', which alternate with the partitive singulars *tulevikku* and *lugemikku*. It is the structure of the final foot *-Ciku* that determines the class of these items. Hence, the noun *HAPNIK* 'oxygen' and the adjective *SALADUSLIK* 'mysterious' both belong to the first declension, even though their genitive singulars have an odd number of syllables. The trisyllabic form *hapniku* consists of an initial Q3 foot (*hap*) and the trochaic foot (*nik.ku*), while the pentasyllabic form *saladusliku* consists of an initial dactyl (*sa.la.dus*) and the trochaic foot (*lik.ku*). Like other first declension genitives, these forms end in a light trochee, and like other polysyllabic forms of this class, they organize feet into trochaic prosodic words. The generally trochaic structure of the first declension is summarized in table 8.

Table 8

Prosodic structure of first declension genitive singulars

$(\sigma.\sigma)$	$(\overset{\wedge}{\sigma}).(\sigma.\sigma)$	$(\sigma.\sigma).(\sigma.\sigma)$	$(\sigma.\sigma.\sigma).(\sigma.\sigma)$
<i>(ma.ja) (lip.pu)</i>	<i>(hap). (nik.ku)</i>	<i>(ko.ri).(do.ri)</i>	<i>(sa.la.dus).(lik.ku)</i>

3.2. The second declension

Partitive singulars in *-t* (or *-d*) are of limited diagnostic value, given that these exponents represent the default realization of partitive singular in modern Estonian. Hence, the metrical structure of the genitive singular assumes a greater role in identifying class outside the first declension. The second declension contains nominals whose genitive singulars exhibit a range of non-trochaic patterns. Monosyllabic genitive singulars, such as *tee* 'road' or *puu* 'tree' form Q3 feet. All disyllabic genitive singulars of regular second declension nouns also contain a Q3 syllable. In nouns that exhibit strengthening gradation, the initial syllable of the genitive singular is Q3, as illustrated by *mõtte* 'thought' in table 5 or *lõuna* 'south'. Other

disyllables also have a Q3 syllable throughout their paradigm. The Q3 syllable may occur initially, as in *`aasta* 'year' or *`veski* 'mill', or finally, as in *tro`fee* 'trophy'. Light trisyllabic genitive singulars are dactylic (Ross, Lehiste 2001 : 49; Viitso 2003 : 17), whether they contain an initial Q1 syllable, as in *kiriku* 'church' or an initial Q2 syllable, as in *raamatu* 'book'. Heavy trisyllables show more variation. Trisyllabic loans with a final Q3 syllable, such as *komi`tee* 'committee' or *kaba`ree* 'cabaret', also tend to inflect according to the second declension pattern. Native trisyllables with an initial Q3, such as *`alguse* 'beginning' belong traditionally to the third declension, but increasingly inflect like second declension nouns, as the result of an ongoing prosodic reanalysis of the initial Q3 syllable, which is discussed in section 3.3 below.

These patterns are summarized in table 9 below. One group of forms, including *`puu*, *tro`fee* and *komi`tee*, consist of or end in a Q3 foot. A second group contains disyllables such as *`mõtte* and *`aasta*, with an initial Q3 syllable. A third group contains light trisyllables such as *kiriku* and *raamatu*. These forms are traditionally regarded as dactylic, but a sequence of three light syllables would be non-trochaic on nearly any alternative, given that the light initial syllable cannot constitute a foot.

Table 9

Prosodic structure of second declension genitive singulars

(˘σ)	(˘σ.σ)	(σ.˘σ)	(σ.σ.σ)	(σ.σ).(˘σ)
(˘puu)	(˘mõtt.te) (˘aast.ta)	(i.˘dee)	(ki.ri.ku) (raa.mat.tu)	(ko.mit).(˘tee)

The inflectional patterns that correlate with these prosodic types are set out in tables 10–12. As a class, second declension nouns lack fusional short illatives and stem partitives (though individual items may retain old short illatives, as in the case of *MAA* 'land', which preserves the short illative *maha*). As in the first declension, the partitive singular can be taken to define the stem of the genitive plural, in which case the second declension genitive plural exponent is *-e* rather than *-te*. Unlike the first declension, the genitive singular provides the base for partitive plurals, which end in *-id* (with *-sid* as an alternative for monosyllabic nouns).

Table 10

Exemplary single-stem second declension nouns

	Sg	Pl	Sg	Pl	Sg	Pl
Nom	<i>`puu</i>	<i>`puud</i>	<i>`aasta</i>	<i>`aastad</i>	<i>raamat</i>	<i>raamatud</i>
Gen	<i>`puu</i>	<i>`puude</i>	<i>`aasta</i>	<i>`aastate</i>	<i>raamatu</i>	<i>raamatute</i>
Part	<i>`puud</i>	<i>`puid/puusid</i>	<i>`aastat</i>	<i>`aastaid</i>	<i>raamatut</i>	<i>raamatuid</i>
		'tree' (2)		'year' (8)		'book' (8)

The structure of the grade-alternating paradigms in table 11 is similar to the structure of those in table 10. The genitive singular again defines the stem of the partitive plural, unambiguously in pairs such as *`mõtte* ~ *`mõtteid*, *`hinde* ~ *`hindeid* and *`ratta* ~ *`rattaid*. The partitive singular serves likewise as the base of the genitive plural in the pairs *mõtet* ~ *mõtete*, *hinnet* ~ *hinnete* and *ratast* ~ *rataste*.

Table 11

Exemplary multiple-stem second declension nouns						
	Sg	Pl	Sg	Pl	Sg	Pl
Nom	<i>mõte</i>	<i>mõtted</i>	<i>hinne</i>	<i>hinded</i>	<i>ratas</i>	<i>rattad</i>
Gen	<i>mõtte</i>	<i>mõtete</i>	<i>hinde</i>	<i>hinnete</i>	<i>ratta</i>	<i>rataste</i>
Part	<i>mõtet</i>	<i>mõtteid</i>	<i>hinnet</i>	<i>hindeid</i>	<i>ratast</i>	<i>rattaid</i>
	'thought' (31)		'price' (31)		'wheel' (33)	

Correlated with a partitive plural in *-id* is a parallel set of semantic case forms which are based on a 'short' stem in *-i* rather than on the 'long' stem in *-(t)e*. As shown in table 12, short alternatives do not exist for the final four semantic cases.⁵

Table 12

Long and short semantic plurals in the second declension						
	I		II		III	
	Sg	Pl	Sg	Pl	Sg	Pl
Stem	<i>puude-</i>	<i>pui-</i>	<i>mõtete-</i>	<i>mõttei-</i>	<i>kirikute-</i>	<i>kirikui-</i>
Illa	<i>puudesse</i>	<i>puisse</i>	<i>mõtettesse</i>	<i>mõtteisse</i>	<i>kirikutesse</i>	<i>kirikuisse</i>
Ines	<i>puudes</i>	<i>puis</i>	<i>mõtetes</i>	<i>mõtteis</i>	<i>kirikutes</i>	<i>kirikuis</i>
Ela	<i>puudest</i>	<i>puist</i>	<i>mõtetest</i>	<i>mõtteist</i>	<i>kirikutest</i>	<i>kirikuist</i>
Alla	<i>puudele</i>	<i>puile</i>	<i>mõtetele</i>	<i>mõtteile</i>	<i>kirikutele</i>	<i>kirikuile</i>
Ades	<i>puudel</i>	<i>puil</i>	<i>mõtetel</i>	<i>mõtteil</i>	<i>kirikutel</i>	<i>kirikuil</i>
Abla	<i>puudelt</i>	<i>puilt</i>	<i>mõtetelt</i>	<i>mõtteil</i>	<i>kirikutelt</i>	<i>kirikuilt</i>
Trans	<i>puudeks</i>	<i>puiks</i>	<i>mõteteks</i>	<i>mõtteiks</i>	<i>kirikuteks</i>	<i>kirikuiks</i>
Term	<i>puudeni</i>	–	<i>mõteteni</i>	–	<i>kirikuteni</i>	–
Ess	<i>puudena</i>	–	<i>mõtetena</i>	–	<i>kirikutena</i>	–
Abes	<i>puudeta</i>	–	<i>mõteteta</i>	–	<i>kirikuteta</i>	–
Com	<i>puudega</i>	–	<i>mõtetega</i>	–	<i>kirikutega</i>	–
	'tree' (2)		'thought' (31)		'church' (12)	

The second declension is more prosodically heterogeneous than the first declension, though the prosodic variation does not correlate with class-defining inflectional patterns. Nominals that end in a Q3 syllable exhibit the most distinctive profile. The partitive singulars of these nominals end in *-d* rather than *-t*, their genitive plurals end in *-de*, and their partitive plurals may end in *-sid*.⁶ One could regard these properties as the basis for assigning nouns ending in Q3 feet to a separate class. However, partitive singulars in *-d* (and genitive plurals in *-de*) are also associated with other Q3-final nominals, such as nouns like KOI 'moth' and PARTII 'party', which lack partitive plurals in *-id* and the *i*-plural series in table 12. Hence, a class of Q3-final nominals would contain two subtypes. One subtype would exhibit the inflectional patterns that define the second declension and the other

⁵ The last four cases are less tightly integrated into the morphological system in other respects, as they do not trigger case concord on an attributive adjective, which instead occurs in the genitive.

⁶ However, partitive singular *-d* cannot be regarded as a phonologically conditioned variant of *-t*, given that *-t* may occur in Q3 monosyllables. The partitive singulars *kuud* 'moon' and *kuut* 'six' (and the genitive plurals *kuude* and *kuute*) provide minimal pairs (brought to my attention by Ilse Lehiste).

would pattern with the 'fourth declension' nominals described in section 3.4 below.

The variation within the closed class of multiple-stem nominals in table 11 also does not motivate additional classes. The heavy disyllabic genitive singulars of these nominals are diagnostic of the second declension, but do not predict any distinctive inflectional patterns. In particular, a heavy genitive singular does not predict the form of the partitive singular, which can exhibit a quantitative contrast, as in *`mõtte ~ mõtet*, or qualitative contrasts, such as *`hinde ~ hinnet*. Although there are patterns that characterize grade-alternating nominals, these patterns cut across classes. A 'class' containing grade-alternating nominals will again contain subtypes, which in this case replicate the general contrast between the first and second declension. Hence, the variation exhibited by multiple-stem nominals is best described by associating these nominals with forms that identify both stems.

3.3. The third declension

As noted above, the third declension contains morphologically complex nouns with nominative singulars ending in *-us*, *-(l)ane*, *-(l)ine*, *-(m)ane* or *-(m)ine*. Table 13 illustrates the two inflectional patterns that mark the third declension: a stem partitive plural in *-i* and a short illative singular in *-CVsse*. As in the first declension, stem partitive plurals such as *`algusi*, *küsimusi* and *inimesi* are fusional forms, in which the *-i* is an exchange variant of the theme vowel *-e*. These stem partitives are based on the genitive singulars *`alguse*, *küsimuse* and *inimese*, not on the partitive singulars, as in the first declension. Third declension nouns also lack long partitive plural alternatives in *-sid*, again in contrast to the first declension. Short illative singulars ending in a heavy *-CVsse* foot are also distinctive to the third declension.

Table 13

	Exemplary third declension nouns					
	Sg	Pl	Sg	Pl	Sg	Pl
Nom	<i>`algus</i>	<i>`algused</i>	<i>küsimus</i>	<i>küsimused</i>	<i>inimene</i>	<i>inimesed</i>
Gen	<i>`alguse</i>	<i>`alguste</i>	<i>küsimuse</i>	<i>küsimuste</i>	<i>inimese</i>	<i>inimeste</i>
Part	<i>`algust</i>	–	<i>küsimust</i>	–	<i>inimest</i>	–
Illa2/Part2	<i>al`gusse</i>	<i>algusi</i>	<i>küsi`musse</i>	<i>küsimusi</i>	<i>ini`messe</i>	<i>inimesi</i>
	'beginning' (12/13)		'question' (12)		'person' (12)	

Prosodically, the third declension patterns with the first declension. Genitive singulars consist of an initial stressed foot followed by a light trochee of the form *Cuse*, *Case* or *Cise*. In light quadrisyllabic genitive singulars, both feet are trochaic. The initial syllable of the first foot bears primary stress and the initial syllable of the second foot bears a secondary stress, as illustrated by *(i.ni).(mè.se)* 'person'.

The third declension also traditionally contains a class of nominals with heavy trisyllabic genitive singulars, such as *`alguse* 'beginning', *`eestlase* 'Estonian' and *`endise* 'former'. When the initial Q3 syllable of these forms exhausts a metrical foot, as in *(`ál).(gù.se)*, *(`éest).(là.se)* or *(`én).(dí.se)*, secondary stress again falls on the first syllable of the second foot and the

nominals inflect according to the third declension pattern. However, these items may also inflect according to the second declension pattern, reflecting the fact that "the language is beginning to forget that overlong syllables were originally disyllabic sequences" (Lehiste 1997 : 26). When the initial Q3 foot is reanalyzed as the first syllable of a heavy foot, the trisyllabic genitive singulars (*˘ál.gu.se*) and (*˘én.di.se*) exhibit a dactylic pattern with no secondary stress, and quadrisyllabic forms based on the genitive singular bear a secondary stress on even-numbered syllables (Hint 1978; Lehiste 1997). The prosodic reanalysis of the initial Q3 syllable is thus reflected in the shift of the secondary stress in the allative singular from (*˘ál*).(gù.se.le) to the innovative (*˘ál.gu*).(sè.le).

The diagnostic role of metrical structure is confirmed by the correlation between foot structure and stress with class-specific patterns of inflection, as the old third declension partitive plurals *˘algusi* and *˘endisi* give way to new second declension forms *˘alguseid* and *˘endiseid*. The correlations between foot structure, stress and inflection class are summarized in table 14. The alternation between the final trochee in (*˘ál*).(gù.se) and the final dactyl in (*˘ál*).(gù.se.le) in the third declension and the converse alternation between the dactylic structure of second declension (*˘ál.gù.se*) and the trochaic structure of (*˘ál.gu*).(sè.le) offer a particularly clear illustration of the "strong tendency towards trochaic stress patterning and to dactylic word-final feet if the trochaic patterning cannot be applied" (Viitso 2003 : 16).

Table 14

Foot-sensitive inflectional and stress variation in trisyllables					
		Old third declension pattern		New second declension pattern	
Gen Sg		(<i>˘ál</i>).(gù.se)	(<i>˘én</i>).(dì.se)	(<i>˘ál.gu.se</i>)	(<i>˘én.di.se</i>)
Alla Sg		(<i>˘ál</i>).(gù.se.le)	(<i>˘én</i>).(dì.se.le)	(<i>˘ál.gu</i>).(sè.le)	(<i>˘én.di</i>).(sè.le)
Part Pl		<i>˘algusi</i>	<i>˘endisi</i>	<i>˘alguseid</i>	<i>˘endiseid</i>

3.4. The fourth declension

Many, if not most, of the word classes recognized in traditional descriptions such as ÖS 2006 can be subsumed under the three basic nominal classes above. However, there are other nominal types that do not fit so naturally within this classification. One comparatively large group can be characterized negatively by the lack of class-defining forms or inflectional patterns. These nominals show only 'default' patterns of exponence: partitive singulars in *-t*, genitive plurals in *-de*, and partitive plurals in *-sid*. In addition, the paradigms of these nominals do not exhibit gradation, and never contain short illatives, stem partitives or short *i*-plural forms. Some representative nominals of this 'type' are given in table 15.

Table 15

Exemplary 'fourth' declension nouns								
	Sg		Pl		Sg		Pl	
Nom	<i>˘koi</i>	<i>˘koid</i>	<i>auto</i>	<i>autod</i>	<i>vahúuta</i>	<i>vahúutad</i>		
Gen	<i>˘koi</i>	<i>˘koide</i>	<i>auto</i>	<i>autode</i>	<i>vahúuta</i>	<i>vahúutade</i>		
Part	<i>˘koid</i>	<i>˘koisid</i>	<i>autot</i>	<i>autosid</i>	<i>vahúutat</i>	<i>vahúutasid</i>		
		'moth' (1)		'car' (7)		'currency' (8)		

Each of the nouns in table 15 can be treated as a defective subtype of one of the basic classes, as they are in some traditional descriptions. These nouns can also be grouped together as members of a prosodically diverse but inflectionally uniform 'fourth' declension. The choice between these alternatives hinges on the relative priority assigned to prosodic and inflectional patterns. An analysis that treats these nouns as exceptions assigns anomalous items to classes based on prosodic properties, whereas an analysis that assigns them to a fourth declension classifies these items on the basis of inflectional patterns. However, in approaching this question it is important to remember that 'classes' are ultimately just proxies for common or congruent morphological patterns. Hence, from an implicational perspective, the central question is: What information do the forms of these nominals provide for deducing the other forms of the same item?

A monosyllabic noun like *KOI* appears to have no properties that identify it as having a defective paradigm, other than the actual lack of non-default forms.⁷ The singular forms of *KOI* are parallel to those of *PUU* in table 10, as are the nominative and genitive plurals and forms based on the genitive plural. It is solely the form of the partitive plural — and the *i*-plural forms based on the partitive plural — that distinguish monosyllabic second and fourth declension nouns. This overlap may also help to explain why nouns like *PUU* are the only second declension nouns that allow partitive plurals in *-sid* as an alternative to the class-appropriate form in *-id*.

The class of polysyllabic fourth declension nouns is cued more robustly by prosodic structure and patterns of exponence, though not always in the same ways as in other classes. The genitive singular of a disyllabic noun such as *AUTO* is not prosodically distinctive, though the final vowel *-o* does not occur as a theme vowel in native nouns and thus identifies *AUTO* as a fourth declension loan. The class of other disyllables is identified by the properties of the genitive and partitive singular. A genitive singular such as *aku* 'battery' does not identify class, given first declension forms such as *elu* 'life'. However, the partitive singular *akut* cannot belong to a first or third declension noun. First declension nouns have vocalic partitives such as *elu*, while third declension nouns have a trochaic word structure and partitive singulars in *-t*. In principle, *akut* could be the partitive singular of a second declension noun (on the pattern of *mōtet* in table 15) but only if it were the weak counterpart of a strong genitive singular with an initial Q3 syllable. Hence the light genitive and partitive singular pair *aku* ~ *akut* can only be forms of a fourth declension noun. A light trisyllabic genitive and partitive singular pair such as *valuuta* ~ *valuutat* 'currency' also belongs unambiguously to the fourth declension. The second declension is the only other class that contains light trisyllabic genitive and partitive singulars. Yet whereas main stress is initial in second declension pairs such as *kíriku* ~ *kírikut* in table 15, trisyllables in the fourth declension often retain a penultimate stress pattern that identifies them as loans. Hence the stress in *valuuta* and *valuutat* is diagnostic of the fourth declension, and a similar

⁷ Though the prosody of genitive plurals (and semantic cases based on them) may serve a diagnostic function. ÖS 2006 identify fourth declension forms such as *ˈkoide* as being consistently Q3, in contrast to second declension forms such as *ˈpuude*, which are marked as being optionally Q3.

pattern identifies the class of pairs such as *šampánja* ~ *šampánjat* 'champagne' or *gorilla* ~ *gorillat* 'gorilla'.

3.5. Principal parts

Traditional descriptions usually treat the nominative singular as a third principal part, though it is often predictable from other basic forms. In the first declension, the nominative singular corresponds to the stem of the partitive singular (i.e., the partitive singular minus the theme vowel), provided that this stem constitutes a prosodic foot. The 'truncated' nominative singular forms *koridor* and *lipp* are thus predictable from the fact that the partitive singulars (*ko.ri*).(do.ri) and (*lip.pu*) are larger than a minimal foot.⁸ The nominative singulars *küla*, *maja*, *sada* and *rida* are also predictable from the fact that the partitive singulars (*kü.la*), (*ma.ja*), (*sa.du*) and (*ri.da*) are not larger than a minimal foot, so that their truncated counterparts **kül*, **maj*, **sad* and **rid* are light monosyllables that do not constitute feet. Given that the variation in the form of nominative singulars is predictable from the prosodic structure of the partitive singular, there is no motivation for dividing the first declension into 'truncating' and 'nontruncating' subtypes. A similar relation holds between the genitive and nominative singular of open-class second declension nouns, with a couple of qualifications. 'Truncated' second declension nominative singulars are minimally disyllabic and cannot be based on forms containing light derivational endings, such as agentive *-ja*, locative *-la*, and caritive *-tu*. Hence the alternations in *raamatu* ~ *raamat*, *kiriku* ~ *kirik* and *nädala* ~ *nädal* 'week' contrast with the preservation of the final vowel in pairs such as *`aasta* ~ *`aasta*, *mesila* ~ *mesila* 'apiary', *lugeja* ~ *lugeja* 'reader' and *muretu* ~ *muretu* 'care-free'. However, as in the first declension, the nominative singular corresponds to the partitive singular stem in grade-alternating paradigms, as illustrated by *mõtet* ~ *mõte*, *hinnet* ~ *hinne* and *ratast* ~ *ratas*.

Nominative singular forms are also largely predictable in the third declension. The correspondence with forms in *-use* depends on word class. Genitive singular forms of nouns in *-use* correspond to nominative singulars in *-us*, as illustrated by *alguse* ~ *algus* and *küsimuse* ~ *küsimus* in table 13. In contrast, genitive singular forms of adjectives in *-use* may correspond to nominative singulars in *-ne*, as illustrated by *tolmuse* ~ *tolmune* 'dusty' or *vaiguse* ~ *vaigune* 'resiny'. Genitives in *-ase*, *-ese* or *-ise* correspond more generally to nominatives in *-ane*, *-ene* or *-ine*, as shown by *`eestlase* ~ *`eestlane* 'Estonian', *inimese* ~ *inimene* 'person' and *nägemise* ~ *nägemine* 'sight'.

In the fourth declension, the genitive and nominative are always identical, as illustrated by the pairs *`koi* ~ *`koi*, *auto* ~ *auto* and *valuuta* ~ *valuuta* in table 15.

⁸ There is also a relation between the partitive singulars that are homophonous with short illatives and those that correspond to truncated nominatives. Since only partitive singulars that are larger than minimal prosodic feet can have stems that constitute prosodic feet, the same partitive singulars that satisfy the requirements on illative singulars will correspond to 'truncated' nominative singulars.

In many paradigms, the nominative singular is clearly of diagnostic value and this is particularly true in the third declension. A nominative singular with a trochaic word structure that ends in *-Vne* or *-us* belongs to the third declension and also predicts the corresponding genitive (and partitive) singular forms because the theme vowel is always *-e* and the partitive exponent is always *-t* in the third declension. Hence, a third declension nominative singular in *-Vne* or *-us* corresponds to a genitive singular in *-Vse/-use* and a partitive singular in *-Vst/-ust*.

Other patterns are of diagnostic value in the first and second declension. If a consonant-final nominative singular is monosyllabic, as in the case of *`tool* or *`lipp*, the noun belongs to the first declension; if it is disyllabic, as in the case of *kirik* or *raamat*, the noun belongs to the second declension. A trisyllabic genitive singular that does not end in *-us* also belongs to the first declension, as illustrated by *koridor* or *seminar* 'seminar'. A vowel-final nominative likewise tends to identify the theme vowel of the genitive. In most noun classes the two vowels are identical, as illustrated by *maja ~ maja*, *`puu ~ puu*, *mõte ~ `mõtte* and *auto ~ auto*. Closed-class paradigms may also exhibit correspondences, such as the general *i ~ e* 'exchange' pattern illustrated by the pairs *nimi ~ nime* 'name', *meri ~ mere* 'sea' or *lumi ~ lume* 'snow'. The diagnostic value of the nominative singular does not of course diminish the value of the partitive and genitive singular forms, but contributes to the robustness of the declensional system, by providing another highly frequent cue for class membership.

4. Implications and conclusions

The correlations between the shape and metrical structure of the genitive and partitive 'principal parts' and the main class-specific forms and patterns are summarized in table 16. With the exception of heavy monosyllables, any genitive and partitive singular pair uniquely identifies the class of a nominal. In many cases, as noted earlier, a single form suffices. The diagnostic value of the principal parts is enhanced by the fact that they function as highly transparent stems of other forms.

Table 16

Diagnostic inflectional and metrical patterns			
	I	II	III
Gen Sg	trochaic foot	non-trochaic foot	trochaic word and foot
Part Sg	V-final	<i>t</i> -final	<i>t</i> -final
Forms	ILLA2, PART2	<i>i</i> -Pl	ILLA2 in <i>-sse</i> , PART2 in <i>-i</i>
Part Pl Stem	Part Sg	Gen Sg	Gen Sg

4.1. Paradigmatic allomorphy

The declensions identified above represent a compromise between two somewhat more extreme positions. On the one side are traditional accounts that assign nouns and adjectives to a larger set of 'word types'. Paul F. Saagpakk (2000) recognizes over 400 types, organized into six classes,

and Harri W. Mürk (1997) distributes 260-odd types over eight classes. More conservative estimates are offered by ÕS (2006 : 18ff.), which identifies 38 basic 'word types', Ülle Viks (1992 : 43ff.), who distinguishes 26 nominal 'types', and EKG I (1995 : 333), who give twelve basic 'exemplary declensional paradigms' (*käändsõnade näidisparadigmad*). An implicational approach is compatible with any of these more fine-grained sub-classifications, provided that they group subclasses into general declensions based on shared patterns of exponence and metrical structure that are broadly similar to those adopted here.

The other extreme is represented by accounts that attempt to treat class-defining patterns of exponence in terms of phonological conditioning. The observation that genitive singulars of most first declension nouns have an even number of syllables while those of second declension nouns often have an odd number of syllables is sometimes taken as evidence that the partitive and genitive plural exhibit syllable-conditioned allomorphy. One basic claim is that *-sid* occurs with 'stems' that contain an even number of syllables, whereas *-id* occurs with stems that have an odd number of syllables. For example, Harri W. Mürk (1997 : 14) suggests that "if the genitive singular has an odd number of syllables then *-id* is added to the genitive singular". This generalization is meant to apply to second declension patterns such as *kiriku ~ kirikuid*. Harri W. Mürk qualifies this claim by proposing that "if a syllable contains an extra-long sound, that syllable will actually count as two syllables" (1997 : 15). This revision classifies *`aasta* and *`aastaid* as trisyllabic by treating the initial syllable *`aast* as the disyllable from which it is historically derived. In order to treat *`diivani* and *`diivaneid* 'sofa' as trisyllables, Harri W. Mürk then qualifies the first revision so that "syllables containing extra-long sounds count as two syllables only if they occur in the last syllable or next-to-last syllable of a word" (1997 : 15).

The weaknesses of this type of description are highly revealing, because they help to clarify the difference between prosodic cues that are of value in deducing class membership from prosodic contexts that condition the selection of a particular case allomorph. There are three classes of counterexamples to the claim that the choice of plural exponent is phonologically conditioned: stems with an even number of syllables that occur with *-id*, nominals with an odd number of syllables that occur with *-sid*, and classes in which the exponent is in fact conditioned, but by non-prosodic factors. Second declension monosyllables like *PUU* illustrate the first type of case. The genitive singular form *`puu* is 'disyllabic' by Harri W. Mürk's criteria since it contains a Q3 syllable, which counts as two syllables. Hence, the partitive plural form *`puusid* conforms to his account, but the acceptability of *`puid* is unexpected, as *-id* should only occur with stems that contain an even number of syllables. Reclassifying *`puu* as monosyllabic merely reverses this pattern: *`puid* would now be expected and *`puusid* becomes problematic. Second declension nouns like *tro`fee* and *komi`tee* present an analogous conundrum. No consistent strategy for determining the syllable count of Q3 syllables can treat the choice between *-id* and *-sid* as phonologically conditioned within the subclass of second declension nouns that allow partitive plurals in *-id* and in *-sid*. The lack of variation within heavy fourth declension nominals gives

rise to similar difficulties. Treating Q3 monosyllables as disyllabic permits an account of nouns such as KOI, since the 'disyllabic' `koi corresponds to the partitive plural `koid. The same criteria classify the genitive singular *par`tii* as trisyllabic, which predicts the unacceptable **par`teid*, rather than the correct *par`tiisid*. Treating Q3 syllables as monosyllables again merely reverses the pattern: *par`tii* becomes disyllabic and *par`tiisid* is correctly predicted, but `koi becomes monosyllabic, so that *`koid rather than `koid is now predicted. Light fourth declension nouns are also problematic. Disyllabic *auto* correctly predicts *autosid*, but trisyllabic *valuuta* incorrectly predicts **valuutaid*, rather than *valuutasid*.

The mediating role of class affiliation is equally clear in cases where particular exponents are associated with specific classes. For example, nouns with nominative and genitive singulars in *-ja* all belong to the second declension, irrespective of their prosodic structure. Nouns in *-ja* may be heavy disyllables, such as `laulja 'singer' or `sõitja 'passenger', heavy or light trisyllables, as in pärija 'heir', valija 'voter', `hooldaja 'guardian' or `näitleja 'actor', or they may consist of four light syllables, as in *asutaja* 'founder' or *õpetaja* 'teacher'. The ending *-ja* identifies each of these as second declension nouns, even though it does not determine a uniform structure.

René Kager (1996) and Mary Paster (2006) propose a variation on Harri W. Mürk's analysis in which the syllable structure of the actual stem of a genitive or partitive form conditions affixal allomorphy. Drawing on Harri W. Mürk's analysis and data, they suggest that stems with an even number of syllables have vowel-final partitive singulars, genitive plurals in *-de* and partitive plurals in *-sid*. Stems with an odd number of syllables are said to have partitive singulars in *-t*, genitive plurals in *-te* and partitive plurals in *-id*. Monosyllabic stems that occur with *-sid*, as in the case of `puusid and `koid, are problematic for this account, as are heavy disyllables that occur with *-id*, such as tro`feid. Reclassifying syllable count to accommodate these forms just creates counterexamples out of monosyllabic stems that occur with *-id*, such as `puid, and disyllabic stems that occur with *-sid*, such as *par`tiisid*. Genitive plural forms raise similar problems. In the first declension, a heavy disyllable can realize the partitive singular and serve as the stem for a genitive plural in *-de*, whereas in the second declension, a heavy disyllable can serve as the stem for a partitive singular in *-t* and a genitive plural in *-te*. The contrast between the first declension partitive singular and genitive plural forms `lippu and `lippude and the second declension counterparts `aastat and `aastate cannot be attributed to any prosodic difference between the stems `lippu and `aasta. Equally problematic is the fact that fourth declension nominals occur with the exponents *-t/-de/-sid*, irrespective of syllable count, and that all second declension nominals in *-ja*, etc., occur with the exponents *-t/-te/-id*.

Some inflectional contrasts can be attributed to differences in foot structure rather than syllable structure, as in the case of the alternation between `algusi and `alguseid discussed in section 3.3 above. But this type of variation is the exception rather than the rule. No obvious prosodic contrasts are responsible for the difference between the paradigms of Q3 monosyllables such as PUU and KOI or for the contrasts between the exponents

that occur with heavy first declension stems such as *lippu* and second declension stems such as *aasta*. Phonological conditioning provides the wrong model for the analysis of intrinsically morphological variation. The form of genitive and partitive plurals tend to be consistent within a class, and classes correlate with the form of the partitive plural and the metrical structure of the genitive singular. But the correlation between these singular and plural forms is indirect, mediated through the paradigm or class of a nominal, and they cannot be treated as cases of stem-conditioned selection. The conditioning environment is not the phonological shape of any stem form, but the paradigm or class of an item.

More generally, a syntagmatic analysis provides an inapplicable frame of reference for the analysis of paradigmatic variation. Each declension class or subtype in Estonian is defined by a set of interdependent patterns, so that knowledge of one form provides information about others. A speaker encountering a heavy partitive singular *lappi* 'cloth' will recognize this as a first declension form and be able to infer the nominative plural *lapid* (and, indeed, the rest of the paradigm), even though the nominative plural is based on the genitive singular *lapi*, not the partitive singular. A dactylic genitive singular, such as *redeli* 'ladder' is likewise recognizable as a second declension form and implies the genitive plural *redelite* (along, again, with the rest of the paradigm), even though the genitive plural is based on the partitive singular, in this case *redelit*, in the second declension. These deductions cannot be reduced to syntagmatic conditioning because a diagnostic form need not provide the base for the forms that it predicts. One form may predict a second form by providing the stem of the second form, but this is merely a limiting case of prediction.

4.2. Declensional cohorts

Just as deductions based on part-whole relations have no special status within the implicational structure of a paradigm, sets of forms based on a common stem need not play any distinguished role within a system, nor need they even comprise a coherent morphosyntactic class. This is particularly clear in the paradigms of grade-alternating nominals, in which the distribution of strong and weak stems identifies forms with a common base. As illustrated by the paradigms of LIPP and MÖTE in table 17, the forms of a grade-alternating nominal are organized into two heterogeneous 'cohort' sets, organized around the genitive and partitive singular principal parts. In the first declension, the partitive cohort set includes the nominative and short illative singular, along with the genitive and partitive plurals and plural semantic case forms. The genitive cohort set contains the nominative plural and singular semantic cases. The second declension differs in assigning the partitive plural (and semantic case forms based on the *-i* plural stem) to the genitive cohort set. Moreover, the grade of the cohort sets varies systematically in the two classes: in the first declension, the partitive set is strong and the genitive set is weak, whereas in the second declension, the partitive set is weak and the genitive set is strong.

Cohort sets in grade-alternating paradigms					
		First declension		Second declension	
		Sg	Pl	Sg	Pl
Nom		<i>\lipp</i>	<i>lipud</i>	<i>mõte</i>	<i>\mõtted</i>
Gen		<i>lipu</i>	<i>\lippude</i>	<i>\mõtte</i>	<i>mõtete</i>
Part		<i>\lippu</i>	<i>\lippusid</i>	<i>mõtet</i>	<i>\mõtteid</i>
Illa2/Part2		<i>\lippu</i>	<i>\lippe</i>	–	–
Illa		<i>lipusse</i>	<i>\lippudesse</i>	<i>\mõttesse</i>	<i>mõtetesse/\mõtteisse</i>

There is no underlying morphosyntactic or morphosemantic unity to cohort sets, in terms of the realization of case or number features. Nor, conversely, is any morphological case based consistently on a particular principal part or stem. In both declensions, the nominative and genitive cases are based on different stems in the singular and plural. The nominative is based on the partitive stem in the singular and on the genitive in the plural. The nominative singular is, correspondingly, strong in the first declension and weak in the second declension, whereas the nominative plural is weak in the first declension and strong in the second. The genitive reverses this pattern, as it realizes the genitive stem in the singular and is based on the partitive stem in the plural. Hence neither stem can realize nominative or genitive case and they cannot even be taken to realize a more abstract 'feature' that forms part of a 'compositional meaning' associated with the nominative or genitive, given that these cases are realized by different stems in the singular and plural. The same is true of each of the semantic cases, which are based on the genitive stem in the singular and, ultimately, on the partitive stem in the plural.

In sum, the grammatical heterogeneity of cohort sets confirms the futility of any neo-Jakobsonian approach that might seek to attribute the distribution of stems to 'general case meanings'. Patterns of stem syncretism in grade-alternating declensions define cohort sets, but these sets comprise pure form classes. A speaker that encounters one member of a cohort set can therefore deduce the stem of other members of that set, and, given the limited affixal variation in Estonian, can likely predict the whole forms. A strong partitive cohort set also implies a weak genitive set in the first declension. So the organization of forms into cohorts facilitates deductions about form variation within a paradigm. It is just that the morphological information about the assignment of forms to cohort sets that guides deductions is orthogonal to natural morphosyntactic classes. It is, of course, always possible to set up a parallel inventory of 'stem features' to describe cohort sets. However, these features will have no connection to genuine case 'meanings', general or specific.

Where morphosyntactic features do play a significant implicational role is in identifying the paradigm cell that a given form realizes. Although it is convenient to talk about deductions between forms, it is the properties of forms that realize particular paradigm cells, rather than the properties of forms in isolation, that is of value in identifying class and deducing new forms. To take an extreme example, a vowel-final partitive singular is an unambiguous marker of the first declension. Yet all nouns have vowel-

final stems, because the genitive singular always ends in a vowel. Hence a vowel-final stem is of no predictive value in isolation. A speaker needs to know whether a given vowel-final form realizes the partitive singular, but an abstract stem *qua* form has no features that can be used to predict this distributional property. Even stem inventories can be relatively uninformative in isolation. Just knowing the strong stem *lippu* and a weak stem *lipu* does not allow a speaker to identify the class of LIPP or deduce any of its inflected forms, given that MÖTE also has a strong stem *mõtte* and a weak stem *mõte*. It is only by knowing which cells these stems realize in the paradigms in table 17 that a speaker can assign LIPP to the first declension and MÖTE to the second. A speaker may abstract stems from word forms in order to deduce other forms of an item, or may recognize stems as the common elements of a cohort set. However, any representation of stems independent of paradigm cells disrupts the implicational structure of a declension.

4.3. Paradigm uniformity

Each of the declensions identified above contain subtypes, characterized by distinctive form inventories and/or patterns of interdependency. In addition to questions about the split between classes and subclasses, these subtypes raise questions about paradigm uniformity, since there are often patterns that are of predictive value within a subtype but not within a class or the system as a whole. The plural grammatical cases provide a particularly clear illustration. Although the nominative plural is always based on the genitive singular, the genitive and partitive plural forms exhibit class-specific variation. The paradigm of LIPP in table 17 shows the most general first declension pattern, in which the genitive and partitive plural are both based on the partitive stem. The paradigm of MÖTE likewise shows the 'crossing' pattern characteristic of the second declension, in which the genitive plural is based on the partitive stem and the partitive plural on the genitive stem. The same class-specific patterns are exhibited by the other multiple-stem first declension nominals in table 7 and by their second declension counterparts in table 11.

However, implicational relations are less determinate in single-stem paradigms. In a first declension paradigm without gradation, the partitive and genitive singular are identical, so either can serve as the stem of the genitive and partitive plurals. In single-stem second declension paradigms, the partitive plural can be formed by adding *-id* to the genitive singular or to the partitive singular less the ending *-t*. The genitive plural corresponds, as noted above, to the partitive plural plus *-e* and also to the genitive singular plus *-te*. Both analyses are internally motivated: adding *-e* preserves the *-t* of the partitive singular, while adding *-te* expresses a parallel with *-de*, which marks the genitive plural in the first and fourth declensions. This ambiguity is reflected in descriptions of the genitive plural, which is often said to be based on the partitive singular, but which is just as often analyzed morphotactically as consisting of an ending *-de/-te* and a base which, in the second declension, corresponds to the genitive singular form. Juhan Tuldava (1994 : 196) provides a succinct statement of this analysis when he states that "if the partitive singular ends

in *-t*, this *-t* is replaced by the suffix *-te* in the genitive plural". A similar analysis is likewise implicit in a wide range of sources, from basic school grammars (Kaldma 1992) through general and theoretical works (EKG I 1995; Viitso 2003).

For pedagogical purposes, it may be useful to identify a pattern that applies across open and closed classes of nouns. Within a derivational approach, it is indeed necessary to identify a unique base for the partitive and genitive plural. However, it is worth emphasizing again that one is not forced to make this kind of choice on an implicational perspective of the sort adopted in treatments of 'analogical forms' (*analoogiavormid*) in Estonian grammars. It is possible to regard the partitive singular as a reliable predictor of the genitive plural in general, and treat the genitive singular as a useful predictor of the genitive plural for single-stem nominals in the first and second declension. The fact that multiple principal parts may predict the form of the genitive plural does not lead to derivational indeterminacy, but instead enhances the robustness of a network of implicational links.

The same kind of pattern arises in the third declension and, more strikingly, in the fourth. A genitive plural such as *autode* can again be described by "replacing the *-t* in the partitive singular by the suffix *-de*". Yet there are no class-internal grounds for basing the genitive plural *autode* on the partitive singular *autot* rather than on the genitive singular *auto*, or even the nominative singular *auto*. The sole justification for any choice rests on patterns in grade-alternating paradigms that fall entirely outside the fourth declension. Approaching the same question from a more psychological angle, one is naturally led to ask why a speaker should fail to exploit the predictive value of the genitive or nominative singular of a fourth declension noun solely because the corresponding form would be an unreliable predictor in other noun classes. Although a derivational perspective forces a choice, it is not clear why system-level patterns should override 'islands of reliability' in such cases.

Conversely, however, the analogical influence of highly frequent and regular patterns are evident in the ongoing evolution of the declensional system. The prosodic reanalysis of forms such as *alguse* and *endise* (discussed in section 3.3 above) has the effect of bringing the nouns ALGUS and ENDINE into the second declension, which contains the majority of nouns with trisyllabic genitive singulars in Estonian. This development also shifts the declension classes in the direction of the type of syllable-based system suggested by Mati Hint (1978; 1997). The expansion of the partitive singular marker *-t* represents another ongoing change that is shifting the orientation of the class system. Vowel-final partitive singulars appear to be stable within the grade-alternating subtype of first declension nominals such as LIPP. However, there seems to be an increasing tendency for single-stem nominals to occur with the partitive singular marker *-t*. In the case of proper names, this pattern is apparently already well established, so that the singular forms *maja* ~ *maja* ~ *maja* of the common noun 'house' in table 2 contrast with the pattern *Maja* ~ *Maja* ~ *Majat* for the corresponding proper name (Karl Palasaju, p.c.). If generalized, this change would have the effect of shifting light disyllabic nominals out of the first declension and into

the fourth. The first declension would then contract to a class containing grade-alternating nominals and those light disyllables that were frequent enough to retain vowel-final partitive singulars. The 'minimal' fourth declension paradigms would, correspondingly, come to represent the productive pattern for light disyllables.

4.4. Conclusions

The descriptions in preceding sections outline how the basic declension classes in Estonian are cued by diagnostic contrasts in form and prosody. A remarkable feature of this system is that neither the classes themselves nor the sets of forms that identify class are morphosyntactically coherent. In particular, declensions do not correlate with gender (which Estonian lacks altogether) or with any other nominal property. Instead, a great deal of the form variation within the Estonian declensional system is carrying a 'purely morphological' signal. By identifying the class of an item, this variation aids a speaker in interpreting a given form and permits the analogical deduction of new forms of the same item. Form variation within the declensional system of Estonian thus provides a striking case of what Mark Aronoff (1994) calls 'morphology by itself'. The organization of this system also accords nicely with the traditional view that alternations are 'morphological' at the point where they are not externally conditioned by phonological or syntactic factors.

The interlocking prosodic and affixal patterns summarized above also highlight a number of features of the declension class system of Estonian. The role of contrasts and multiple cues calls into question the goal of seeking a unique diagnostic form for complex paradigms. Within traditional models, the use of unique principal parts (and exemplary paradigms) is probably best regarded as a matter of expository convenience, though some contemporary accounts appear to carry a more substantive commitment to unique bases (e.g. Albright 2002). The variation across classes also suggests that deductive patterns need not be an all or nothing affair. A pattern may be of predictive value within a given domain even if it is subject to qualifications or permits exceptions outside that domain. The fact that implicational patterns are often symmetrical, suggests that implicational relations are just a special case of relations of mutual information, in the information-theoretic sense (Shannon 1958). More generally, as in the case of the conjugational system, the systematic use of prosodic and morphological variation to cue 'purely morphological' classes, series and cohort sets suggests the 'morphological overhead' that is required to maintain a class system with the complexity of Estonian declensions.

Address:
James P. Blevins
University of Cambridge
jpb39@cam.ac.uk

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ДЖЕЙМС П. БЛЕВИНС (Кембридж)

ТИПЫ СКЛОНЕНИЙ В ЭСТОНСКОМ ЯЗЫКЕ

Несмотря на то, что падежная система эстонского языка отличается большой вариативностью, склоняемые слова легко сгруппировать, причем типов оказывается не так уж много. В основе классификации лежат взаимосвязи между основными падежами. При определении типа склонения главная роль принадлежит форме партитива единственного числа и просодической структуре генитива единственного числа. Поскольку формы остальных падежей четко связаны с этими двумя падежами, их всегда можно возвести по крайней мере к одному из них или к какой-либо иной падежной форме, образованной от основного падежа. Падежная система эстонского языка имеет четко выраженный морфологический характер.