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CONJUGATION CLASSES IN ESTONIAN*

Abstract. The relation between the quantity system of Estonian and the complexity of its inflection classes is brought out clearly by word-based analyses in which the primary part-whole relation in the system holds between words and larger sets of word forms. The central role of prosodic contrasts reflects the fact that classes correlate with characteristic grade alternations, and are not cued by any obvious syntactic or semantic properties. The modern system is organized into three basic conjugations, which differ principally in the patterns that they exhibit in the Present and Infinitive series. First conjugation verbs are in the strong grade in the Present series and in the weak grade in the Infinitive series. Second conjugation verbs are weak in the Present series and strong in the Infinitive series, and third conjugation verbs are invariant throughout. Additional form variation that does not reinforce the basic stem-grade classes is either phonologically conditioned or lexically idiosyncratic. Although it is not always possible to determine class from a single form, class is identifiable from contrasts between many pairs of forms, including such minimal pairs as 2sg and 2pl imperatives, or present and past negatives. The systematic use of prosodic and morphological variation to cue 'purely morphological' classes and series in Estonian is of considerable general interest, as it not only supports a traditional view of inflection classes as genuine form classes but also indicates the 'morphological overhead' that is required to maintain an inflection class system with the complexity of the Estonian system.

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

1. Introduction

Estonian is well known for its ternary opposition between the syllabic quantities Q1, Q2 and Q3, and for the complexity of its inflection class system. Yet the ways in which these aspects of the language reinforce each other are less widely appreciated, in part because descriptions stated in terms of syllables and morphemes tend to obscure the organization of the inflectional system. Despite claims to the contrary, no patterns of inflection appear to be directly sensitive to syllable structure in the modern language. Instead, prosodically conditioned allomorphy is foot-based

(Lehiste 1965; 1997), reflecting the fact that Estonian often continues to treat Q3 syllables as the disyllables from which they are historically derived. Hence classifying items on the basis of syllable count splits classes into subtypes with no distinctive patterns of inflection.

The problem is compounded if, as in many traditional accounts, items are classified in terms of the syllable count of citation forms, the supine (or *ma*-infinitive) in the case of verbs. The supine is a highly regular form and exhibits much less variation than the traditional infinitive (or *da*-infinitive). As well, the supine identifies the base of the highly productive derivational forms, including derived agentive nominals in *-ja* and process nominals in *-mine*. Yet the same regularity that makes the supine a suitable citation form reduces its diagnostic value. In particular, the stem of the supine is of limited classificatory value, given that all verbs that show gradation have a supine in the strong grade. Of course a single form does not always suffice to identify the class of an item in a complex inflectional system, as acknowledged by traditional grammars that list multiple principal parts for each item. But even if one must select a single form, the supine is still a relatively uninformative choice.

The large number of inflection classes in many descriptions of Estonian thus reflects the fact that syllable count in general, and the shape of citation forms in particular, are poor predictors of inflectional patterns. In contrast, the shape, metrical structure and grade of other 'principal parts' correlate closely with patterns of morphologically conditioned variation. Analyses based on these diagnostic forms can not only reduce the number of inflection classes but also bring out the organization of these classes. The key insights of this type of approach are that the inflectional system of Estonian is fundamentally word-based, and that classes tend to be characterized more by paradigm-internal patterns of contrast than by the shape of any one individual form. This perspective also clarifies why attempts to disassemble the system into smaller units, such as syllables or stems, disrupts the implicational structure of the system and creates the need to introduce additional classes that restore this lost information.

The present paper suggests how a fairly traditional 'word and paradigm' (WP) perspective can bring out the prosodic and implicational structure of conjugation classes in Estonian.[1] At the same time, an examination of the Estonian system identifies idealizations within WP models, notably the idea that that implicational relations apply solely to sets of unique diagnostic forms, rather than over the larger sets of forms that are of some predictive value in a paradigm. The concluding sections draw general implications from the Estonian inflectional system and comment on the role that 'purely morphological' patterns play in maintaining complex systems.

2. The Estonian conjugational system

It is useful to begin with a general overview of conjugation classes in Estonian before considering parts of the system in greater detail. In certain respects, the Estonian system presents a mirror image of the class systems

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[1] A companion paper, to appear in a subsequent issue of LU, applies a similar approach to the declensional system, extending the analysis in Blevins 2005; 2006 and addressing issues that arise on this account.

of Indo-European languages. In Indo-European languages, classes are predominantly marked by affixal variation, while inflectional stems tend to be relatively constant. In Estonian, by contrast, endings exhibit comparatively little variation. Apart from a handful of verbs with past forms in *-i-* rather than *-si-* (discussed in section 2.4.3), personal agreement markers are regular, as shown by the endings in table 1 (which do not separate stem formatives).

Table 1

Regular personal endings

	Pres(ent) Ind(icative)		Pres Cond(itional)		Past/Imperfect	
	Sg	**Pl**	**Sg**	**Pl**	**Sg**	**Pl**
1	*–n*	*–me*	*–ksin*	*–ksime*	*–sin*	*–sime*
2	*–d*	*–te*	*–ksid*	*–ksite*	*–sid*	*–site*
3	*–b*	*–vad*	*–ks*	*–ksid*	*–s*	*–sid*

Affixal variation within the regular conjugational system is thus largely confined to the patterns in table 2. But even this description overstates the amount of variation, as many of the choices are interdependent and nearly all are phonologically conditioned. The sole class-sensitive pattern involves the alternation between the short endings *-da/-ge/-gu* and the geminate endings *-ta/-ke/-ku*. Following a vowel-final stem, the endings *-ta/-ke/-ku* are unambiguous markers of the second conjugation verbs. Yet even this pattern reinforces the prosodically defined conjugation classes.

Table 2

Conjugational endings in Estonian

Infinitive	*-da/-ta/-a*
2pl Imper(ative)	*-ge/-ke*
Jussive	*-gu/-ku*
Past Part(iciple)	*-nud*
Supine	*-ma*
Pres(ent) Part	*-v*
Evidential	*-vat*
Imp(ersonal) Neg Ind	*-da/-ta*
Imp Pres	*-dakse/-takse/-akse*
Imp Past	*-di/-ti*
Imp Past Part	*-dud/-tud*
Imp Imper	*-gu* (or *-tagu/-dagu*)

Although at most one set of endings shows morphologically conditioned allomorphy, form variation within the conjugational system still determines a robust class system. Classes are identified by prosodic c o n t r a s t s between pairs of diagnostic word forms, rather than by affixal patterns. Metrical structure and morphological grade both play a prominent role in the inflectional system as a whole, though their specific contribution varies strikingly between declensions and conjugations. In the nominal system, declension classes correlate most directly with the metrical structure of the genitive singular. Grade is of primary importance in distinguishing forms within the paradigms of grade-alternating classes. But grade is of subsidiary

importance in defining the class system, because the majority of noun types do not exhibit gradation. The situation is reversed in conjugations. Here classes exhibit characteristic patterns of grade alternation, and metrical structure plays no direct role in defining classes.

2.1. Conjugation classes

The importance of grade alternations is evident in standard descriptions of the conjugational system. Open-class verbs can be assigned to the three basic conjugations in table 3, which follows EKK (Erelt, Erelt, Ross 2000 : 277) in essential respects.[2] Third conjugation verbs are based on a single, prosodically invariant, stem. The light third conjugation pattern is illustrated by ELAMA 'live', whose paradigm is based on the Q1 stem *ela*. The heavy pattern is illustrated by TARBIMA 'consume', whose paradigm is based on a stem with an 'overlong' (Q3) initial syllable. Third conjugation verbs may thus be based on a prosodically light stem, as in the case of *ela*, or on a heavy Q3 stem, as in the case of `*tarbi*.[3] Yet because these stems do not a l t e r n a t e within a paradigm, they are neither morphologically 'weak' nor 'strong'. Alternations between weak and strong stems are confined to the first and second conjugations. In productive classes, the strong stem contains an initial Q3 syllable, and the weak stem contains an initial Q2 syllable. A first conjugation verb, such as ÕPPIMA 'study', exhibits a 'weakening' alternation between the infinitive form `*õppida*, which is based on the strong stem `*õppi* and the present form *õpin*, which is based on the weak stem *õpi*. A second conjugation verb, such as HÜPPAMA 'jump' exhibits a 'strengthening' alternation between the infinitive form *hüpata*, which is based on the weak stem *hüpa*, and the present form `*hüppan*, which is based on the strong stem `*hüppa*.[4]

Table 3

Basic conjugation classes
(strong forms in bold, weak forms in italics)

	I ('Weakening')	II ('Strengthening')	III (Invariant)	
Infinitive	**`õppida**	*hüpata*	elada	`tarbida
Pres Ind (1sg)	*õpin*	**`hüppan**	elan	`tarbin
Supine	**`õppima**	**`hüppama**	elama	`tarbima
Imp Past	*õpiti*	*hüpati*	elati	`tarbiti
	'study' (55)	'jump' (67)	'live' (50)	'consume' (51)

2.2. Conjugational series

The forms in table 3 highlight the limited diagnostic nature of the supine. Although a light supine identifies a light third conjugation verb, a heavy supine is compatible with the remaining three types. The forms in table 3

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[2] The numbers in parentheses in these tables identify the 'word types' (*tüüpsõnad*) from Erelt 1999. Finite present and past paradigms are represented by 1sg forms and conditional paradigms by their 3sg form.
[3] Because Q3 is not always marked orthographically, Q3 syllables are identified by a grave accent.
[4] The 'quantitative' patterns of gradation in the first and second conjugations are discussed in section 2.3.

also show that first and second conjugation verbs are not distinguished by their form inventories, since verbs of both classes have strong and weak stems. Instead, it is the distribution of strong and weak stems that is contrastive. Classes are defined by the distribution of stems across the sets of forms that comprise conjugational s e r i e s in Estonian. Table 4 sets out the interaction between conjugation classes and series. Each series in table 4 exhibits a distinctive pattern of class-specific stem alternations. In the Infinitive series, first conjugation verbs are strong and second conjugation verbs are weak. The Present series reverses this pattern, as the first conjugation is weak and the second conjugation is strong. Both conjugations are strong in the Supine series, and both are weak in the Impersonal series. Third conjugation verbs remain invariant in all series.

The three stem-grade classes in table 4 represent the smallest class inventory that can be defined by the three grade alternations, i.e., weakening, strengthening and invariant. These are, moreover, the only classes defined by form variation in the conjugational system. Some accounts arrive at a slightly larger number of classes, either by segregating verbs according to syllable count, or by including other types of variation.[5] Yet, the patterns that define these additional classes are different in character from those that define the stem-grade classes. The patterns that determine the three prosodic classes are all morphological, in the sense that they are neither lexically idiosyncratic nor phonologically conditioned. In contrast, the variation that defines an expanded class inventory tends to be conditioned or idiosyncratic.

Table 4

Conjugational series in Estonian
(cf. Viks 1992 : 52)

Series	Form	I	II	III	
Infinitive	Infinitive	**`õppida**	*hüpata*	elada	`tarbida
	2pl Imper	**`õppige**	*hüpake*	elage	`tarbige
	Jussive	**`õppigu**	*hüpaku*	elagu	`tarbigu
	Gerund	**`õppides**	*hüpates*	elades	`tarbides
	Past Part	**`õppinud**	*hüpanud*	elanud	`tarbinud
Present	Ind (1sg)	*õpin*	**`hüppan**	elan	`tarbin
	Cond (3sg)	*õpiks*	**`hüppaks**	elaks	`tarbiks
	2sg Imper	*õpi*	**`hüppa**	ela	`tarbi
Supine	Supine	**`õppima**	**`hüppama**	elama	`tarbima
	Pres Part	**`õppiv**	**`hüppav**	elav	`tarbiv
	Evidential	**`õppivat**	**`hüppavat**	elavat	`tarbivat
	Past (1sg)	**`õppisin**	**`hüppasin**	elasin	`tarbisin
Impersonal	Pres	*õpitakse*	*hüpatakse*	elatakse	`tarbitakse
	Past	*õpiti*	*hüpati*	elati	`tarbiti
		…	…	…	…

The stem-grade classes in table 4 may be reinforced in varying degrees by differences in the choice of 'theme' vowels and inflectional endings.

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[5] For example, EKK (2000 : 277) propose four basic classes, EKG I (Erelt, Kasik, Mets-lang, Rajandi, Ross, Saari, Tael, Vare 1995 : 344ff.) suggest five classes, Ü. Viks (1992 : 48ff.) identifies seven classes and H. W. Mürk (1997 : 49ff.) proposes eight main classes.

For example, only second conjugation verbs have the infinitive ending -*ta* after a vowel-final stem. So a verb with an infinitive that ends in -V*ta* must belong to the second conjugation. But theme vowels and endings are not reliable markers of class in general, and no set of secondary markers is sufficient to maintain the class system without the prosodic contrasts. This point will now be established by considering the additional sources of form variation and showing that they do not define morphological classes.

2.3. Qualitative gradation

The three stem-grade classes show the only productive prosodic alternations in the conjugational system. Stems are especially uniform in the invariant third conjugation, and prosodic 'quantitative' gradation is the only productive alternation in the first and second conjugations. Some patterns of 'qualitative gradation', in which strong forms contain a consonant that is missing or lenited in weak forms, are retained in the first and second conjugation. The forms of LENDAMA 'fly' and LUGEMA 'read' in table 5 below illustrate the two characteristic patterns of qualitative gradation. In the second conjugation, strong forms such as `lendan* contain a segment, here '*d*', which does not occur in a weak (and prosodically light) form such as *lennata*. In the first conjugation, a strong form such as *lugeda* contains a '*g*' that again does not occur in weak forms such as `loe*. But the morphologically weak forms in the first declension, such as `loe*, contain Q3 syllables that make them phonetically 'heavy'. As this example shows, the morphological grade of a form is defined in the context of its inflectional paradigm and cannot be determined by phonological or phonetic properties in isolation. Whereas Q3 forms `õppida* or `hüppa* realize the strong grade in the paradigms of ÕPPIMA and HÜPPAMA, the Q3 forms in the paradigm of LUGEMA are morphologically weak.

Table 5

Qualitative and irregular grade alternations

Series	Form	I	II	'Double'	Irregular
Infinitive	Infinitive	**lugeda**	*lennata*	`**kanda**	`**panna**
	2pl Imper	**lugege**	*lennake*	`**kandke**	*pange*
	Past Part	**lugenud**	*lennanud*	`**kandnud**	*pannud*
Present	Ind (1sg)	`*loen*	`**lendan**	*kannan*	*panen*
	Cond (3sg)	`*loeks*	`**lendaks**	*kannaks*	*paneks*
	2sg Imper	`*loe*	`**lenda**	*kanna*	*pane*
Supine	Supine	**lugema**	`**lendama**	`**kandma**	*panema*
	Pres Part	**lugev**	`**lendav**	`**kandev**	*panev*
	Past (1sg)	**lugesin**	`**lendasin**	`**kandsin**	*panin*
Impersonal	Pres	`*loetakse*	*lennatakse*	`*kantakse*	*pannakse*
	Past	`*loeti*	*lennati*	`*kanti*	`**pandi**
		'read' (57)	'fly' (68)	'carry' (63)	'put' (54)

The dissociation of morphological grade from phonological quantity is the key to interpreting the variation in the paradigm of KANDMA 'carry' in table 5. The defining property of strong forms, such as `kanda*, is the pres-

ence of a '*d*' that is lost in weak forms. As it happens, the strong forms in the Infinitive and Supine series are also heavy (Q3), and contrast prosodically with the weak forms in the Present series. However, this prosodic contrast is not grammatically distinctive. The forms in the Impersonal series are also prosodically heavy, as they are based on a Q3 stem. But, like `*loe*, the Impersonal forms of KANDMA are morphologically weak because they lack the '*d*' that marks the strong forms in this qualitative pattern.

The paradigm of PANEMA 'put' exhibits one of the idiosyncratic patterns that characterizes a small number of items, in this case roughly a half-dozen verbs (EKK 2000 : 283). In the paradigm of PANEMA, most of the Impersonal series and a few forms in the Infinitive series are heavy, and the remaining forms are light. Unlike third conjugation verbs, the prosodic contrast between heavy and light forms is contrastive, and, as section 2.4.2 shows, heavy forms behave in some respects like strong forms. Yet these contrasts do not conform to the first or second conjugation pattern, and they certainly do not provide the basis for a synchronic class, given that the few verbs that inflect like PANEMA show further idiosyncratic variation. The two verbs that inflect like PESEMA 'wash' differ in having a strong past participle (`*pesnud* vs *pannud*) and a strong present impersonal form (`*pestakse* vs *pannakse*). Another group includes verbs such as MINEMA 'go' and OLEMA 'be', which exhibit suppletion and other irregularities. The variation within this small collection of verbs undermines any attempt to group them into a subclass that is of more than purely historical interest, and no other qualitative patterns that cross-cut stem-grade classes are more systematic.

2.4. Affixal variation

Tables 4 and 5 also exhibit a number of affixal patterns that are sometimes taken to define additional classes. The first of these patterns is illustrated in table 4, where the geminate endings -*ta* and -*ke* of *hüpata* and *hüpake* alternate with the short endings -*da* and -*ge* of *elada*/*elage* and `*õppida*/`*õppige*.[6] The geminate ending -*ke* of the 2pl imperative form `*kandke* contrasts similarly with the -*ge* of *lugege* and *pange*. The 'jussive' ending -*gu*/-*ku* shows the same variation. The paradigms of KANDMA and PANEMA exhibit yet a third variant of the infinitive ending, as the -*a* in `*kanda* and `*panna* contrasts with -*da*/-*ta* in *elada*, `*õppida*, *hüpata* and *lugeda*. A second, converse, pattern is shown by the Impersonal series in table 5. In this case, the endings -*da* and -*di* of `*panda* and `*pandi* take the place of the geminate endings -*ta* and -*ti* that occur in `*loeta*/`*loeti* and `*kanta*/`*kanti*. The past paradigm of PANEMA illustrates a final — and more lexically restricted — pattern. Here the 1sg form *panin* lacks the '*s*' formative that marks regular past forms such as 1sg *elasin*, `*õppisin*, `*hüppasin*, *lugesin* and `*kandsin*.

Although this affixal variation cross-classifies verbs in various ways, a close examination of the patterns indicates that they do not motivate an extension of the inflection class system beyond the three stem-grade classes.

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6 The terms 'short' and 'geminate' endings reflect the fact that the relevant contrast between the stop series *p*, *t*, *k* and *b*, *d*, *g* is length, not voicing. Intervocalically, the geminate stops -*t* (/tt/) and -*k* (/kk/) are syllabified differently from the non-geminates -*d* (/t/) and -*g* (/k/), as a syllable boundary splits -*t* and -*k*.

Even the variation within the Infinitive series that is genuinely morphological in character reinforces rather than extends the stem-grade classes. The remaining variation is either conditioned by phonological (or morphophonological) factors, or else represents lexical idiosyncrasies within a small number of verbs. In short, while affixal variation may characterize a group of verbs within a larger class, or exhibit a conditioned pattern that cuts across classes, it is never the basis of a morphological class.

2.4.1. The Infinitive series

The variation within the Infinitive series is displayed in tables 6 and 7 below. The short Infinitival endings *-da* and *-ge* have the widest distribution, and the use of variants is conditioned by morphological as well as by phonological factors. The morphological pattern is illustrated first in table 6. In the first and third conjugation, the Infinitive forms of verbs with vowel-final stems occur with the endings *-da*, *-des*, *-ge* and *-gu*. However, in the second conjugation, verbs are marked by the geminate infinitive form *-ta*, the gerundive *-tes* and geminate forms of the imperative *-ke* and the jussive *-ku*. The class-specific affixal contrasts in table 6 thus complement the prosodic properties that define stem-grade classes. In principle, a verb with a light Infinitive series could belong either to the second or the third conjugation. However, as noted earlier, the endings in table 6 disambiguate the class of a light Infinitive form. A single form such as *hüpata* or *lennata* (or the corresponding gerunds and imperatives) immediately identify HÜPPAMA and LENDAMA as second conjugation verbs. Hence the morphologically conditioned variation between *-da* and *-ta* (or *-des/-tes*, *-ge/-ke* or *-gu/-ku*) does not motivate additional classes, but instead reinforces the stem-grade classes.

Table 6

Morphologically conditioned contrasts in the Infinitive series

	I		**II**		**III**	
Infinitive	`õppida	lugeda	hüpata	lennata	elada	`tarbida
Gerund	`õppides	lugedes	hüpates	lennates	elades	`tarbides
2pl Imper	`õppige	lugege	hüpake	lennake	elage	`tarbige
Jussive	`õppigu	lugegu	hüpaku	lennaku	elagu	`tarbigu
	'study'	'read'	'jump'	'fly'	'live'	'consume'

The remaining variation within the Infinitive series is conditioned by the final segment of the verb stem. Outside the second conjugation, the default endings *-da*, *-des* and *-ge* follow vowel-final stems, as illustrated in table 6. The short endings also follow *s*-final stems, where they are represented o r t h o g r a p h i c a l l y by *-ta*, *-tes* and *-ke*, as illustrated by forms such as `*maksta/*`*makstes/*`*makske* 'cost' (I. Lehiste, p.c.). The vocalic endings *-a* and *-es* follow other consonant-final stems. This pattern is shown by the infinitive and gerund forms of TAPMA 'kill', SAATMA 'send', MINEMA 'go' and NÄGEMA 'see'. The form of infinitive endings may also be conditioned by the final consonant of a stem. The default form *-ge* (and *-gu*) occurs after a sonorant, whereas the geminate *-ke* follows the non-sonorants *-p*, *-k*, and *-h* in table 7.

Table 7

Phonologically conditioned contrasts in the Infinitive series

Infinitive	`tappa	`saata	`minna	näha	`süü[j]a	`jääda
Gerund	`tappes	`saates	`minnes	nähes	`süü[j]es	`jäädes
2pl Imper	`tapke	`saatke	minge	`nähke	sööge	jääge
	'kill' (59)	'send' (58)	'go' (54)	'see' (66)	'eat' (49)	'stay' (49)

The final column in table 7 illustrates a more subtle case of phonological conditioning. T.-R. Viitso (2003 : 65) states that the "formative -*a* occurs" following a number of verb types with consonant-final stems as well as "with monosyllabic vocalic stems ending in a diphthong or a long monophthong but not *aa*, *ee*, and *ää* (`süüa 'to eat', `juua 'to drink', `viia 'to take away', `käia 'to walk')". Yet the verbs he cites are transcribed with a glide between the stem and ending in EKK 2000 : 40 and in Mürk 1997 : 177ff. In his discussion of vowel quality, T.-R. Viitso (2003 : 21) assigns a similar analysis to the infinitive and gerund of SÖÖMA 'eat':

"It is recommended that the orthographical sequence *üü* should be pronounced not as a long monophthong but as the diphthong [*üi*] when directly followed by a vowel *a*, *e* or *u* (cf. `süüa [*süija*] 'to eat', `süües [*süìjes*] 'while eating')."

The glides in these forms satisfy a general syllabification rule in Estonian that requires each non-initial syllable to begin with a single consonant (I. Lehiste, p.c.). Hence, even the variation in the final column in table 7 correlates with a phonological contrast, namely the presence or absence of a glide. The endings -*a* and -*es* follow long monophthongs that are produced with a glide. Verb stems ending in long vowels without glides are followed by the default endings -*da* and -*des*, as in the case of `jääda in table 7. The default imperative endings occur with both stem types, since neither glides nor vowels are voiceless. The key point is that the distribution of infinitive endings correlates with independent phonological properties of the verb stem and again does not justify the introduction of any morphological subclass.

2.4.2. The Impersonal series

As in the Infinitive series, affixal variation in the Impersonal series consists of morphological patterns that reinforce the stem-grade classes, as well as phonologically-conditioned patterns that cut across classes. But in direct contrast to the Infinitive series, it is the geminate endings -*ta*, -*ti*, -*tud*, etc. that have the widest distribution in the Impersonal series. The non-geminate counterparts, -*da*, -*di*, -*dud*, etc., are conditioned either by phonological or morphophonological factors. The purely phonological pattern is illustrated first in table 8. The *l*-final stems in table 8 are all followed by short endings. This pattern appears to be exceptionless and indifferent to verb class and stem grade. The alternating forms of verbs such as TEGELEMA 'deal with' are particularly revealing. In the written language and in careful speech, the stem-final schwa is retained and the default geminate endings are required, yielding forms like *tegeletud*. However, in natural speech, the final schwa is

usually elided, producing an *l*-final stem which takes the non-geminate endings, as illustrated by *tegeldud*.[7]

Table 8

Phonologically-conditioned contrasts in the Impersonal series

	I		II	III
Neg Ind	ei tegeleta	ei tegel**da**	ei `laul**da**	ei vestel**da**
Pres Ind	tegeleti	tegel**di**	`laul**di**	vestel**di**
Past Part	tegeletud	tegel**dud**	`laul**dud**	vestel**dud**
	'deal with' (63)		'sing' (51)	'chat' (69)

Stems ending in long vowels, *-n* and *-r* show the more intricate pattern in table 9.

Table 9

Morphophonological contrasts in the Impersonal series

Supine	`hüüdma	`müüma	`kandma	panema	`murdma	`naerma
Infinitive	`hüüda	`müüa	`kanda	`panna	`murda	`naerda
Neg Ind	ei `hüüta	ei `müüda	ei `kanta	ei `panda	ei `murta	ei `naerda
Pres Ind	`hüüti	`müüdi	`kanti	`pandi	`murti	`naerdi
Past Part	`hüütud	`müüdud	`kantud	`pandud	`murtud	`naerdud
	'shout' (63)	'sell' (54)	'carry'	'put'	'break' (63)	'laugh' (61)

Accounts that collapse the patterns in tables 8 and 9 give the impression that the Impersonal series exhibits phonologically conditioned alternations that are disrupted by exceptions and irregularities. For example, H. W. Mürk (1997 : 31) suggests that "if the partitive [i.e., infinitival] suffix *-da* is preceded by the consonants *n*, *l* or *r*, then the impersonal marker will be *-da* instead of *-ta*". This generalization applies to the impersonal infinitive `*naerda*, which has the (homophonous) personal infinitive `*naerda*, and to `*panda* (if *-a* is taken as an allomorph of *-da* in the infinitive *panna*). But it does not account for the occurrence of the short ending *-da* in `*müüda*, which has the infinitive `*müüa*, nor for the long ending *-ta* in `*kanta*, which has the infinitive `*kanda*. H. W. Mürk (1997 : 31) deals with these cases by classifying them as exceptions:[8]

"One large group of irregular verbs are those whose stem ends in either *-d* or *-t*. This is best determined by looking at the stem form preceding the suffix ending of the *-ma* infinitive, for example, `*võtma* 'to take' `*andma* 'to give' `*nutma* 'to cry'. All of these verbs have certain irregularities in the impersonal forms [---] Finally, there is a handful of common verbs that have irregular impersonal forms. They are usually those verbs that have irregular *da* infinitive forms such as `*olla* 'to be', `*tulla* 'to come' or `*süüa* 'to eat'."

J. Tuldava (1994 : 271) offers a general rule that applies to long vowels, *n* and *r* (and *l*) and then suggests a pair of qualifications to account for the retention of long endings:[9]

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[7] The variation between the supine `*vestlema* and the infinitive *vestelda* also illustrates a case of metathesis. Second conjugation verbs in *-lema* have a strong Present and Supine stem in *-le* and a weak Infinitive and Impersonal stem in *-el*, though this segmental contrast again reinforces the basic stem-grade pattern.

[8] H. W. Mürk's idiosyncratic notational is regularized here, so that, e.g., `*võtma* replaces his *võTma*.

[9] The slashes in these forms divide forms into stems and endings but do not mark syllable boundaries.

"If preceded by a long vowel, a diphthong, or the consonants *l, n, r*, the participle ends with *-dud*: *söö/dud* 'eaten', *käi/dud* 'walked', *laul/dud* 'sung', *pan/dud* 'put' [−−−]

Contrary to the [−−−] rule above, *-tud* is used after a diphthong, *n* or *r* if the verb has a *-d-* before *-ma* in the [*ma-*]infinitive: *leid/ma* 'to find' > *lei/tud* 'found', *kand/ma* 'to carry' > *kan/tud* 'carried', *murd/ma* 'to break' > *mur/tud* 'broken', *tund/ma* 'to know' > *tun/tud* 'known'.

Also in contradiction to the [−−−] rule above, *-tud* is used after a long vowel or diphthong if there is a shift in the vowel sound of the stem."

In assessing claims about the 'irregular' or 'exceptional' character of these patterns, it is relevant that the affixal contrasts in the Impersonal series involve closed sets, and that some of these sets contain few and indisputably irregular members. Yet the appearance of irregularity in table 9 can be regarded as an artifact of a phonological description of what is, at least in part, a morphophonological alternation. The misclassification of this pattern is due in part to the erroneous inclusion of *l*-final stems, which d o condition the purely phonological alternations in table 8. In contrast, none of the patterns in table 9 are surface true, and they can only be understood by taking into account the role of Q3 syllables in the grade system of Estonian. Q3 syllables realize the strong grade in regular first and second conjugation verbs that exhibit 'quantitative' gradation. But in paradigms that exhibit 'qualitative' gradation, a weak grade form may be lengthened to Q3 to 'compensate' for the historical loss of the segment that marks the strong grade. If one reclassifies the contrasts in table 9 in terms of morphological grade rather than phonological quantity, a pattern emerges. The short endings do not follow all Q3 syllables, but only those Q3 syllables that realize the strong grade. Thus `*müüdi,* `*pandi* and `*naerdi* are all strong in their paradigms, where they alternate with weak Present series containing forms such as 1sg `*müün, panen* and *naeran*, as well as other groups of weak forms. In contrast, the long endings are retained in forms such as `*hüüti,* `*kanti* and `*murti*, in which Q3 marks weak elements in a qualitative grade alternation. The difference in grade between the near-minimal pairs of verbs in table 9 also accounts for the exceptional behaviour of verbs with either "a *-d-* before *-ma*" in the supine or "a shift in the vowel sound of the stem", since both of these descriptions pick out verbs that exhibit qualitative grade alternations.

Before leaving the Impersonal series, it is worth briefly clarifying some additional patterns. As noted by a reviewer, some of the verbs in tables 7 and 9 exhibit further variation in the Impersonal series. The modern language contains approximately 60 verbs with a stem-final *-t* or *-p* which add an epenthetic *-e-* between the consonant and impersonal endings (EKK 2000 : 287). This pattern is illustrated by the forms of TAPMA and SAATMA in table 10. Yet the appearance of *-e-* again appears to be phonologically motivated, at least for the larger group of *t*-final stems, as it permits the syllabification of *t-t* sequences. An additional 5 verbs pattern like VÕTMA in adding *-e-* but also drop the stem-final *-t*. There seems to be little to say about this group other than that they must be sufficiently frequent to maintain a clearly irregular pattern.

Table 10

Epenthesis and stem suppletion in the Impersonal series

Infinitive	ˊtappa	ˋsaata	ˋvõtta	ˋpanna	ˋmüü[j]a	ˋsüü[j]a
Pres Ind	tapetakse	saadetakse	ˋvõetakse	pannakse	müü[j]lakse	süü[j]lakse
Past	tapeti	saadeti	ˋvõeti	ˋpandi	ˋmüüdi	ˋsöödi
	ˊ'kill'	'send'	'take' (60)	'put'	'sell'	'eat'

The forms of PANEMA, MÜÜMA and SÖÖMA in table 10 illustrate further variation within a different closed set of items. Like the infinitive marker *-a* in table 7, the present impersonal ending *-akse* follows consonant-final stem. Yet although the ending of the present impersonal is predictable, the stem is not. The present forms *pannakse*, *müüakse* and *süüakse* are all based on a light (Q2) counterpart of the the Q3 stem that occurs in their infinitive forms. In contrast, the past forms ˋ*pandi* and ˋ*müüdi* are based on the infinitive stem. In the paradigm of sööma, the past impersonal ˋ*söödi* is based on the present stem. These additional patterns certainly help to give a fuller picture of the amount of idiosyncratic form variation within the conjugational system. However, they clearly do not define anything remotely like conjugation classes.

2.4.3. The Supine series

Affixal patterns in the Supine series offer yet another illustration of form variation that does not correlate with conjugation classes. In this series, variation is confined to the past (or imperfect) paradigms, where a few verbs lack the '*s*' formative that occurs in regular past forms. The idiosyncratic character of this group is clear from the description in Viitso 2003 : 56:[10]

"The marker *-i* occurs [---] with verbs with a long monophthong other than *ii*, *ee*, and *üü* and with a group of verbs with the *e*-stem, namely *olema* 'to be', *tulema* 'to come', *panema* 'to put' *surema* 'to die', *tegema* 'to do' and *nägema* 'to see'."

The six verbs listed by T.-R. Viitso (2003) cover all of the *e*-stem verbs with past forms in *-i*. The class of "verbs with a long monophthong other than *ii*, *ee*, and *üü*" contains a few verbs with a stem-final *aa*, *ää*, *oo* or *öö*. Even within this small class, the irregular ending is not predictable, as the 1sg past form ˋ*tõin* of TOOMA 'bring' contrasts with the 1sg past form of POOMA 'hang'. According to ÕS (Eesti keele sõnaraamat ÕS 1999 : 600), this form can either be weak (*poosin*) or strong (ˋ*poosin*), but in either case contains the formative '*s*'. The lack of phonological conditioning is clear from the fact that homophonous verb pairs may exhibit both past forms. The main verb PIDAMA 'hold' has a regular 1sg past *pidasin*, whereas modal PIDAMA 'have to' has the past form *pidin*. The semantically ambiguous item LASKMA 'allow' or 'shoot' is associated with a pair of 1sg past forms, *lasksin* and *lasin*, both of which preserve the 'allow/shoot' ambiguity (ÕS 1999 : 395).

Unconditioned lexical variation of this sort is sometimes taken to justify the introduction of 'minor' classes. Although classes of this kind may be

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[10] The cited forms omit the preceding acute accent that T.-R. Viitso uses to mark non-Q3 syllables.

of diachronic interest, it is unilluminating to define an 'asigmatic' class that contains verbs whose past forms lack 's' because no other properties correlate with an irregular past form. Of the handful of 'epenthetic' *e*-stem verbs (i.e., those that have a stem-final *e* in the supine that is absent in the infinitive), most have past forms in *-i*. But even in this miniscule class, the correlation does not hold with any generality, as MINEMA 'go' (which has the infinitive `*minna*) has suppletive forms such as 1sg past *läksin*. Similar remarks apply to the group of verbs with a stem-final *aa*, *ää*, *oo* or *öö*. The optimal analysis of these types of patterns is surely one in which the verbs in question are individually specified as having a past form that lacks 's'. Grouping these items into an 'asigmatic' class is an empty taxonomic exercise. A class that is characterized by a common irregularity adds no additional information because the lexical idiosyncrasy that defines the class is the s o l e property shared by the members of the class. To know whether a verb belongs to the asigmatic class one must know whether its past form lacks an 's'. So the fact that 1sg past `*tõin* lacks 's' establishes that TOOMA is asigmatic. Yet the only synchronic implication of the fact that TOOMA is asigmatic is that forms such as `*tõin* lack 's' (the alternation between the *-oo-* in `*tooma* and *-õ-* in `*tõin* is not implied by the lack of 's'). In short, classifying TOOMA as asigmatic is of no predictive value because no other property correlates with the absence of 's'.

Moreover, the limited variation in past paradigms underscores the extreme uniformity of personal inflections in Estonian. Whereas personal inflections have a key diagnostic function in the conjugational systems of many Indo-European languages, their counterparts in Estonian are even more invariant than nonfinite markers.

2.5. Summary

The cases considered in section 2.4 do not exhaust the full range of variation in the Estonian conjugational system, though they cover most of the patterns that are taken to establish classes or 'word types' within the system. A reexamination of these affixal patterns brings out a number of general points. It is, first of all, reasonably clear that affixal variation does not define any verb classes in addition to those defined by grade alternations. The externally conditioned and/or lexically idiosyncratic character of the affixal patterns also throws the robustly morphological character of stem-grade classes into sharper relief. Finally, the contrast between minor classes and stem-grade classes emphasizes the predictive dimension of true classes. For a regular verb, any pair of forms drawn from the Infinitive and Present series will suffice to identify the class of the verb and hence allow a speaker to deduce its full conjugational paradigm. For example, the 2sg infinitive form `*hakka* and the 2pl form *hakake* identify HAKKAMA as a second declension verb and imply the strong supine `*hakkama*, and the weak infinitive and past impersonals *hakata* and *hakati*, among other forms. In contrast, any group of items that merely share an isolated lexical idiosyncrasy lacks a similar kind of implicational structure, so that treating these groups as 'classes' adds no information to a description that lists the items individually.

3. Implications and conclusions

The preceding descriptions clarify how conjugation classes in Estonian are cued by diagnostic prosodic contrasts. A remarkable feature of this system is that neither the classes themselves nor the sets of forms that identify class are morphosyntactically coherent. Unlike verb classes in a language like Georgian, Estonian conjugations have no obvious correlation with valence or other syntactic or semantic properties, just as declensions in Estonian do not correlate with gender or other nominal properties. Instead, much of the form variation within the Estonian inflectional system carries an essentially 'morphological' signal. By identifying the series of a form and the inflection 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. Although inflection classes are almost always form classes with secondary syntactic or semantic cues, the lack (or subtlety) of such cues in Estonian highlights the formal character of conjugations. As in most inflection class systems, conjugations comprise networks of interpredictable forms, so that the shape of any one form carries information about the shape of others.

3.1. The morphological character of classes and series

Form variation within the inflectional system of Estonian thus provides a striking case of what Aronoff (1994) calls "morphology by itself".[11] The interaction of conjugations and series in section 2 is fundamentally morphological in the sense that the organization of this system is largely orthogonal to morphosyntactic properties. Each series is a form class, comprised of elements that are based on the same stem in each conjugation class. Like conjugation classes, series often have multiple cues, and there is some morphosyntactic similarity between the forms in a series. However, with the exception of the Impersonal series, this similarity does not provide a basis for d e f i n i n g a series. The Infinitive and Supine series both contain mainly nonfinite forms, but the Infinitive series also contains the 2pl imperative, while the Supine series contains the past indicatives. The Present series contains mostly personal present (or 'nonpast') forms. But if the 2sg imperative is regarded as a present form, there seems to be no principled grounds for not treating the 2pl imperative as a present form as well. No other feature-based definition fares any better. Instead, the relation between series and tense in table 4 is reminiscent of the relation between declension class and gender in Slavic. Slavic declensions are also form classes, as G. Corbett (1991) emphasizes. But a default association with gender provides a secondary cue that reinforces the basic form contrasts.

Because the series in table 4 are morphosyntactically heterogeneous, it is not possible to assign coherent properties to alternating stems, even within a single conjugation. It is a simple matter to isolate the stems that underlie a first or second conjugation paradigm in Estonian. The paradigm of ÕPPIMA is based on *õpi* and `*õppi*, just as the paradigm of HÜPPAMA is

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[11] This is not meant to exclude the possibility that members of morphological classes may 'cluster' in various ways that speakers may be aware of implicitly, for example in the kinds of semantic neighbourhoods investigated in Baayen, Moscoso del Prado Martín 2005.

based on *hüpa* and `*hüppa*. So much is clear. As noted above, one cannot distinguish first from second conjugation verbs on the basis of their stem inventories. But it is also apparent that one cannot identify the strong stem as a general 'infinitive stem' or the weak stem as a general 'present stem', given that the Infinitive series is weak and the Present series is strong in the second conjugation. Parallel difficulties arise if one attempts to classify the strong stem as a 'nonfinite' stem in the first conjugation as a way of accounting for the fact that the nonfinite forms of the Infinitive and Supine series are strong. This classification can only mean that 'the strong stem underlies nonfinite forms in the first conjugation'. It cannot be interpreted as meaning that 'the strong stem is associated with nonfinite features in the first conjugation' without incorrectly preventing the strong stem from underlying the 2pl imperative and past indicative forms. Conversely, the weak stem can be identified as 'the stem that underlies most present forms in the first conjugation' but not as 'the stem that is associated with present features in the first conjugation'. Whatever tense features are associated with the weak 2sg imperative are, again, presumably shared by the 2pl imperative, which is strong in the first conjugation.

Estonian conjugations are thus based on what are termed 'parasitic' (Matthews 1972; 1991) or 'morphomic' (Aronoff 1994) stems. Because these types of stems do not make a consistent morphosyntactic contribution to the word forms that they underlie, they present familiar difficulties for morpheme-based accounts. However, from a traditional perspective, morphomic stems also justify the segmental agnosticism implicit in proportional analogies (Morpurgo Davies 1978). In the context of full word forms, morphomic stems identify the series of a form, contribute to the identification of the class of the associated item and permit the deduction of new forms. Yet extracting these stems from the word forms in which they occur yields units that lack the morphosyntactic coherence and predictive value of the original words. To identify the class of ÕPPIMA and define the forms of this verb, it is not enough to know that it is based on the stems *õpi* and `*õppi*. One must also know the d i s t r i b u t i o n of these stems, as parts of the word forms that make up conjugational series. Hence, any analysis that extracts verb stems must somehow express the original information about distribution that is lost in the process of extraction. In short, class-defining stems can be abstracted from the forms of an item, as in traditional 'abstractive' approaches (Blevins 2006), but the word forms cannot be 'built' from the stems without additional 'assembly instructions' that are not derivable from any of the properties that the stems have *qua* forms.

3.2. Diagnostic gradation

Yet the fact that stem variation is not meaning-driven does not mean that it is mere noise. The stem alternations in table 4 carry a signal of vital importance, as they provide information that allows a speaker to deduce new forms of the verb. More specifically, these patterns directly convey information about the series 'cohorts' of a given verb form and indirectly identify the class of the verb. Any verb form exhibits the stem that is shared with the other members of its conjugational series. Given that patterns of affixal exponence are highly uniform (as shown in tables 1 and

2), any one form also implies the full form of the other members of its series. Each form in each series in table 4 predicts the other members of its series, even though the forms that make up a series need not stand in any derivational or grammatical relation. It is in cases like this that word-based patterns of analogy are perhaps most clearly distinguished from procedures of analysis that segment and recombine sub-word units.

Class can be identified on the basis of pairs of verb forms. Some choices, though not reliable in general, may still be diagnostic for particular classes. A weak Present and strong Supine form identifies a first conjugation verb. A weak Infinitive and strong Supine form identifies a second conjugation verb. For open-class verbs, a light Supine series or a heavy Impersonal series is diagnostic of the third conjugation and an infinitive form in -V*ta* identifies a second declension verb. Pairs consisting of one form from the Infinitive series and one form from the Present series are of the greatest diagnostic value. If both forms are heavy or both are light, then the verb belongs to the third conjugation. In regular first and second conjugation verbs, prosody also distinguishes strong from weak forms. If the Infinitive is strong and the Present is weak, then the verb belongs to the first conjugation; if the Infinitive is weak and the Present is strong, then the verb belongs to the second conjugation. The same patterns characterize verbs that show 'qualitative' gradation, though in these verbs the contrast between strong and weak is realized by differences in segmental composition (and, usually, syllable structure). The fact that each of the possible combinations uniquely identifies the class of a verb confirms the diagnostic value of the Infinitive and Present series, and explains why principal parts are traditionally drawn from these series.

The practical usefulness of pairs drawn from the Infinitive and Present series is reinforced by the fact that these series contain highly frequent forms that function as morphological 'minimal pairs'. The relation between the 2sg and 2pl imperative identifies the class of any verb, since the 2sg belongs to the Infinitive series and the 2pl to the Present series. The pairs *ela ~ elage* and `*tarbi ~* `*tarbige* identify ELAMA and TARBIMA as third conjugation verbs, whereas the pairs *õpi ~* `*õppige* and `*hüppa ~ hüpake* identify ÕPPIMA and HÜPPAMA as first and second conjugation verbs. The contrast between present and past negatives is equally informative. The negative present is expressed by the element *ei* and the stem of the Present series, whereas the negative past is expressed by *ei* and the past participle from the Infinitive series. Hence, the invariant pairs *ei ela ~ ei elanud* and *ei* `*tarbi ~ ei* `*tarbinud* are diagnostic of the third conjugation, whereas the alternating pairs *ei õpi ~ ei* `*õppinud* and *ei* `*hüppa ~ ei hüpanud* identify first and second conjugation verbs. These patterns are summarized in table 11.

Table 11

Diagnostic 'minimal pairs' from the Present and Infinitive series

	Imperative		Negative		
	2sg	**2pl**	**Pres**	**Past**	
I	õpi	`õppige	ei õpi	ei `õppinud	**Weak ~ Strong**
II	`hüppa	hüpake	ei `hüppa	ei hüpanud	**Strong ~ Weak**
III	ela	elage	ei ela	ei elanud	**Invariant**
III	`tarbi	`tarbige	ei `tarbi	ei `tarbinud	

The robustness of the system is greatly enhanced by the fact that verb class is identified by pairs of frequent forms with very similar distributions. The minimal pairs in table 11 also highlight two more general points. The first concerns the role of grade alternations. The stems in table 11 are distinguished by the opposition between strong (Q3) and weak (non-Q3) syllables. Without these grade alternations, the stems would cease to be contrastive and the first and second conjugation would be mostly indistinguishable from the third. A more subtle point concerns the role of grammatical meaning. Although grammatical (as opposed to lexical) meaning cannot be reliably associated with stems in isolation, the meaning of word forms is of critical importance in identifying the series of the form and the class the associated verb. Furthermore, the distributional contexts in which form variation is diagnostic are defined in terms of grammatical meanings. In the context of imperative mood, the variation between 2sg and 2pl forms identifies the class of a verb. In a negative context, the variation between present and past tense forms is similarly diagnostic. Hence, a word-based analysis of the Estonian system does not attempt to deny the significance of grammatical meaning, but merely declines to push this meaning down to the level of stems.

3.2. Conclusions

The prosodic and affixal patterns summarized above suggest a number of general conclusions about the conjugational class system of Estonian. There appear to be three basic classes, and most of the additional variation seems to be externally conditioned or idiosyncratic. The conjugations are true form classes, reflecting characteristic stem alternations, principally in the Present and Infinitive series. More generally, the systematic use of prosodic and morphological variation to cue 'purely morphological' classes and series — without any obvious supporting syntactic or semantic correlates — suggests something about the 'morphological overhead' that is required to maintain an inflection class system with the complexity of the Estonian system.

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ТИПЫ СПРЯЖЕНИЯ В ЭСТОНСКОМ ЯЗЫКЕ

Сложные отношения между квантитативной системой и типами словоизменения в эстонском языке четко выявлены с помощью анализа, в основе которого лежит слово. Важную роль просодических контрастов отражает тот факт, что типы словоизменения коррелируют с чередованием ступеней, но не зависят от синтаксических и семантических признаков. Современная система состоит из трех типов спряжения, принципиальное различие между которыми отражают формы настоящего времени и инфинитивов. Глаголы первого типа имеют сильную ступень чередования в формах настоящего времени и слабую — в формах инфинитива. Глаголы второго типа спряжения, наоборот, в настоящем времени имеют слабую ступень, а в инфинитивах — сильную. Глаголы третьего типа спряжения не подвержены чередованию ступеней. Однако не всегда возможно определить тип спряжения глагола по отдельной его форме, во многих случаях для установления типа спряжения нужна пара форм, например, такая минимальная пара, как 2-е лицо единственного числа и 2-е лицо множественного числа императива или отрицательные формы настоящего времени и имперфекта. Систематическое использование просодического и морфологического чередований при классификации чисто морфологических типов в эстонском языке представляет значительный интерес и в более общем плане.