Gradual expansion in the use of the definite article – Checking a theory against the Old Hungarian Corpus

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Outline

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The project

Hungarian **G**enerative **D**iachronic **S**yntax (HGDS)

supported by the Hungarian Scientific Research Fund
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Research Institute for Linguistics, Hungarian Academy of Sciences

The aims of the project

- to digitise all the Old Hungarian records and some selected texts from the Middle Hungarian Period, and to build an online searchable historical language corpus
- to reconstruct the syntax of different synchronic systems, and to examine and model the syntactic changes

The aim of the present talk

- to explore and present the possibilities and the limits of checking a linguistic hypothesis against a larger amount of data

Data:
Five (at least) normalised codices from the Old Hungarian Corpus

The hypothesis to be checked:
the expansion in the use of the article

Historical language stages of Hungarian

Proto-Hungarian		1000 BC – 896 AD
Old Hungarian	Early Old Hungarian	896 – 1370
	Late Old Hungarian	1370 – 1526
Middle Hungarian		1526 – 1772
Modern Hungarian		1772 – present day

The definite article in Old Hungarian – the data

Modern Hungarian

(1)

a	szerzetes-nek	***a***	könyv-e
the	monk-DAT	*the*	book-POSS

'the book of the monk'

(2)

a	te	könyv-ed
the	your	book-POSS.2SG

'your book'

Old Hungarian

(3)

a(z)	szerzetes-nek	∅	könyv-e
the	monk-DAT		book-POSS

'the book of the monk'

(4)

∅	te	könyv-ed
	your	book-POSS.2SG

'your book'

The definite article in Old Hungarian – the data

Modern Hungarian

(5)	ez/az	***a***	könyv
	this/that	*the*	book
	'this/that book'		

Old Hungarian

(6)	e(z)/a(z)	∅	könyv
	this/that		book
	'this/that book'		

(7)	a.	az	kapu	b.	az	kapu
		the	gate		*that*	gate

The definite article in Old Hungarian – the hypothesis

Regular appearance of this early determiner in semantic and pragmatic contexts where only an article can appear (e.g. *larger situational use, associative-anaphoric use*) ⇒ true article

Investigation by a manual search on a closed uniform text:
the Gospel of Matthew in the *Munich Codex*
(the first half of the Late Old Hungarian period)

- to classify the articleless noun phrases with a definite interpretation
- to understand why the article is still absent

The definite article in Old Hungarian – the hypothesis

The early definite article appears only in the constructions where the referent of the noun phrase is not anchored in another way, thus absent:

- with proper names and with a group of lexemes that describe entities with a prototypically unique referent
- with demonstratives
- with possessor expressions
- in case of a generic reading of the noun phrase

The absence of article in definite contexts (Munich Codex)

Proper names and nouns with unique referent

nouns with special lexical properties → inherently referential

a group of lexemes describing entities with a prototypically unique referent: *god, lord, father* (referring to God), *devil, king, queen, heaven* etc.

(8)	és	Ø	*atyá-t*	senki	sem	esmerte	hanemcsak	Ø	*fiú-t*
	and		father-ACC	nobody	not	knew	but		son-ACC

'neither knoweth any men the Father, save the Son' [Matt 11:27]

The absence of article in definite contexts (Munich Codex)

Modified by a demonstrative

directly accessible reference → necessarily definite

(11)	*Az*	*napok-ban*	jövő	Jánus	baptista
	that	days-INE	came	John	Baptiste

'In those days John the Baptist came' [Matt 3:1]
in Latin: *in diebus illis*

New pattern: *determiner doubling* (only from Middle Hungarian)

(5')	az	***a***	könyv
	that	*the*	book

'that book'

The absence of article in definite contexts (Munich Codex)

Possessive structures: pronominal possessors

the referent of the possessed noun is identified via its relation to the referent of the possessor → prototypically definite

(14) És elhozaték egy tálnyér-on ∅ *ő feje*
and was.brought a platter-SUP his head-POSS.3SG
'And his head was brought on a platter' [Matt 14:11]

The absence of article in definite contexts (Munich Codex)

Possessive structures: nominal possessors

no determiner on the head noun

(15)	az	gyermek-nek	∅	lelk-é-t
	the	child-DAT		soul-POSS-ACC

'the soul of the child' [Matt 2:20]

(16)	az	papok	∅	fejedelm-i-hez
	the	priests		chief-POSS.PL-ALL

'to the chiefs of priests' [Matt 26:57]

The absence of article in definite contexts (Munich Codex)

Generic reading: without article ↔ individual reading: with article

(21)
Tahát felkelvén parancsola ***az*** *szelek-nek* és ***az*** *tenger-nek* (...)
so up.getting commanded *the* winds-DAT and *the* sea-DAT
'*So he got up and commanded the winds and the sea (...)*

Bizony az emberek csudálkodnak vala, mondván: Minemő ez,
verily the men were.amazed AUX saying what.kind this
The men were amazed, saying: "What kind (of man) is this,

mert ∅ *szelek* és ∅ *tenger* engednek neki?
that winds and sea obey.they to.him
that the winds and the sea obey him!"' [Matt 8:26-27]

The definite article in Old Hungarian – spreading

In the Middle Hungarian period (from the 16th century onward) the definite article appears in new contexts:

- co-occuring with demonstratives
- preceding a possessed noun with dative-marked possessor

Manual checking of the NT *loci* in a later Old Hungarian ms. Codex Jordánszky (1516-1519) → expansion in article use with generic NPs and before possessive pronouns

Aims:

- to demonstrate the proportional increase in the use of the article *within* the Old Hungarian period
- to find out in which context(s) it took place earlier

The definite article in Old Hungarian – spreading

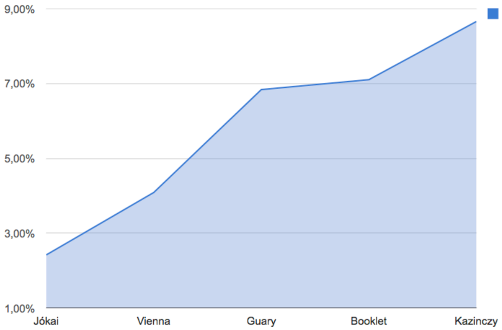


Figure: The proportion of definite articles in five Old Hungarian codices

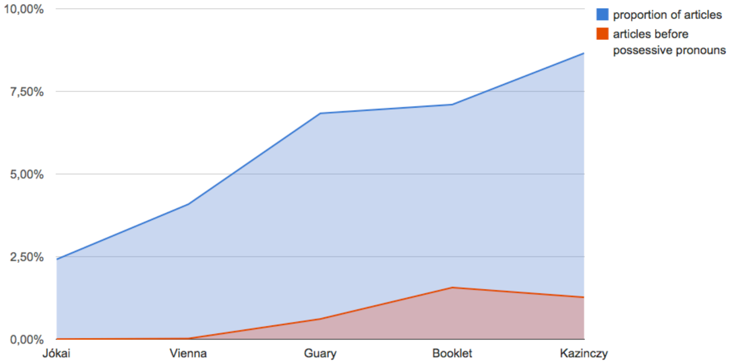
In a modern Bible translation: 11,12%

The definite article in Old Hungarian – spreading

Table: Increase in article use in specific contexts

Context	Method	Increase in article use
Nouns with unique referent	One by one checking of lexical items in the corpus	slightly; inconsistent results
Demonstratives	Automatic query	none
Possessives (pron.)	Automatic query	√
Possessives (nom.)	Automatic query	none/minimal
Generics	Not possible automatically	???

The definite article in Old Hungarian – spreading



Corpus building: the texts

no antecedent → building a corpus of Old Hungarian codices is a pioneering effort

the amount of texts to process:

- 48 codices
- 27 shorter texts

all together approx. 2 million tokens, from which about 1.5 million are already searchable

The acquisition of source data

a part of source data has already been converted into some electronic format

a significant part was only available in print:

```
for codex in codices:
    if codex is short:
         typewriting
    else:
         scanOCRmanualcheck
```

Scan&OCR

1. scanning in high resolution – high enough to OCR
2. key aspect of an OCR software: training system to make it able to deal with other languages → Abby FineReader 9.0 Professional edition

special characters cause problems

Heterogeneous orthography

- the Hungarian writing system evolved from the need to translate Latin religious texts, but the adaptation of the Latin alphabet to Hungarian posed several problems
- there are Hungarian phonemes which do not exist in Latin, so new characters were needed to represent them
- sound-letter correspondences vary a lot even within a single text sample, e.g. *Vylag uilaga* [világ világa]
- one letter could stand for multiple sounds, e.g. *zerzete zerent* [szerzete szerint]
- some letters can refer to vowels and consonants as well, e.g. the letters *u,v,w* were used to denote the *u,ú,ü,ű,v* sounds

Representing Hungarian sounds

representing the Hungarian sounds which do not exist in Latin:

1. without diacritics: combination of more letters, e.g. *cs [tʃ]* $\longrightarrow$ *ch* $\sim$ *cz* $\sim$ *chy* $\sim$ *chi* $\sim$ *cy*
2. with diacritics: a similar letter with diacritics, e.g. *cs* $\longrightarrow$ *ć* $\sim$ L $\sim$ L’
3. mixture, e.g. *cs* $\longrightarrow$ *ch* $\sim$ *chy* $\sim$ *cyh* $\sim$ *c* $\sim$ *chi* $\sim$ *ch’* $\sim$ *cz* $\sim$ *ts* $\sim$ *ć* $\sim$ L $\sim$ L’ $\sim$ L*h* $\sim$ L*z*

Maintaining and representing the original spelling: Unicode

- international standard
- consistent encoding for the most of the world's writing systems
- the various accented and multi-accented characters are properly handled, e.g. $e + \text{‘} + \bar{\ } = \bar{\grave{e}}$

standard Unicode characters in UTF-8 encoding

uniformity is a basic requirement of asking queries in the whole corpus
BUT: there are some Old Hungarian characters which are not present in Unicode → replacement character, e.g. $\mathrm{L} \longrightarrow \check{c}$

Normalisation

original	normalised
a varoſba	a városba
ahazi	a házi
annėphėz	a néphez
az arpak	az árpák
ānėp	a nép
a” tew	a tű
a’ nyaar	a nyár
a · mendenhato	a Mindenható

orthographic variants of the same lexical items must be neutralised and converted into Modern Hungarian spelling

Morphological analysis and disambiguation

normalised wordform → automatic morphological analysis → automatic disambiguation → manual check

Humor ('**H**igh speed **U**nification **MOR**phology'): originally developed for Modern Hungarian → extended version of the lexicon and the morphological rules for Old Hungarian has been created

hunpos: statistical POS-tagger → requires a quite large amount of manually disambiguated Old Hungarian texts as a training corpus

Text processing levels

six levels and five tasks can be distinguished throughout the processing of the texts

(1) scanned codex
→ OCR
(2) raw OCR result
→ *manual* correction
(3) original spelling
→ *manual* normalisation
(4) normalised form
→ *automatic* morphological analysis
(5) lemmatised and POS-tagged words
→ *semi-automatic* disambiguation
(6) disambiguated corpus

Corpus architecture

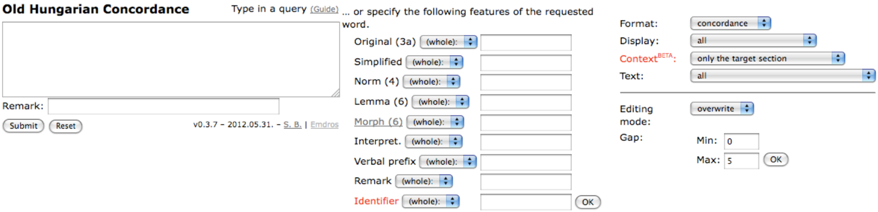
page	line	orig	norm	lemma	analysis
001	01	Mÿ	mi	mi	Pro.Nom_Gen
001	01	vronknac	urunknak	úr	N.PxP1.Dat_Gen
001	01	iesus	Jézus	Jézus	N:P.Nom
001	01	cristusnac	Krisztusnak	Krisztus	N:P.Dat_Gen
001	01	gyczeretÿre	dicséretire	dicséret	N.PxS3=i.Sub
001	02	es	és	és	C
001	02	gyczewsegere	dicsőségére	dicsőség	N.PxS3.Sub
001	02	es	és	és	C
001	02	my	mi	mi	Pro.Nom_Gen
001	02	atyancnak	atyánknak	atya	N.PxP1.Dat_Gen
001	03	bodog	boldog	boldog	Adj
001	03	ferencznek	Ferencnek	Ferenc	N:P.Dat_Gen

Searching on every level

- our corpus contains all the text processing levels, and the query interface allows the user to refer to these levels even simultaneously
- the presentation of corpus results is independent of the query: different levels can be used in display and in the query

http://ohc.nytud.hu/

User interface



Old Hungarian Concordance

Type in a query (Guide) ... or specify the following features of the requested word.

Remark:

v0.3.7 – 2012.05.31. – S. B. | Emdros

Original (3a) (whole):

Simplified (whole):

Norm (4) (whole):

Lemma (6) (whole):

Morph (6) (whole):

Interpret. (whole):

Verbal prefix (whole):

Remark (whole):

Identifier (whole):

Format: concordance

Display: all

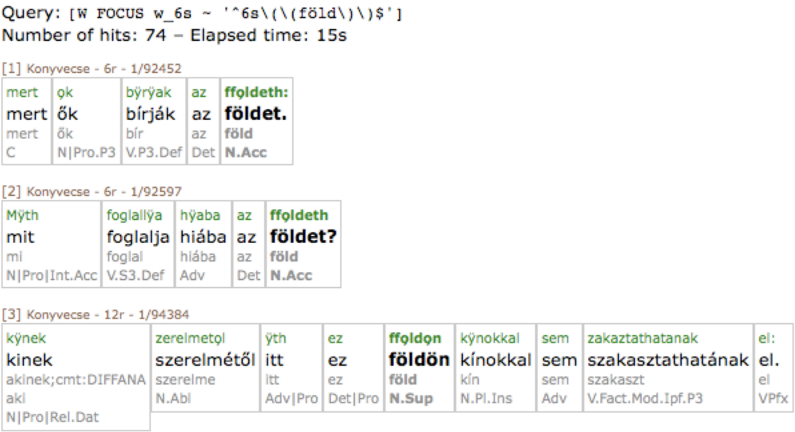
Context^{BETA}: only the target section

Text: all

Editing mode: overwrite

Gap: Min: 0 Max: 5

Corpus query result



Query: `[W FOCUS w_6s ~ '^6s\(\(föld\)\)$']`
Number of hits: 74 – Elapsed time: 15s

[1] Konyvecse - 6r - 1/92452

mert	ǫk	bÿrÿak	az	**ffǫldeth:**
mert	ők	bírják	az	**földet.**
mert	ők	bír	az	**föld**
C	N|Pro.P3	V.P3.Def	Det	**N.Acc**

[2] Konyvecse - 6r - 1/92597

Mÿth	foglallÿa	hÿaba	az	**ffǫldeth**
mit	foglalja	hiába	az	**földet?**
mi	foglal	hiába	az	**föld**
N|Pro|Int.Acc	V.S3.Def	Adv	Det	**N.Acc**

[3] Konyvecse - 12r - 1/94384

kÿnek	zerelmetǫl	ÿth	ez	**ffǫldǫn**	kÿnokkal	sem	zakaztathatanak	el:
kinek	szerelmétől	itt	ez	**földön**	kínokkal	sem	szakaszthatának	el.
akinek;cmt:DIFFANA	szerelme	itt	ez	**föld**	kín	sem	szakaszt	el
aki	N.Abl	Adv|Pro	Det|Pro	**N.Sup**	N.Pl.Ins	Adv	V.Fact.Mod.Ipf.P3	VPfx
N|Pro|Rel.Dat								

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corpus query tool: `http://ohc.nytud.hu`
downloadable publications:
`http://www.nytud.hu/oszt/elmnyelv/mgtsz.html`