

Bioinformatische Methoden in der historischen Linguistik

*Historische Linguistik: Lautwandel und
lexikalischer Wandel*

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Gotisch

Atta unsar þu in himinam,
weihnai namo þein.
qimai þiudinassus þeins.
wairpai wilja þeins,
swe in himina jah ana airpai.
hlaif unsarana þana sinteinan
gif uns himma daga.
jah aflet uns þatei skulans sijaima,
swaswe jah weis afletam
þaim skulam unsaraim.
jah ni briggais uns
in fraistubnjai,
ak lausei uns af þamma ubilin.

Neuhochdeutsch

Vater unser im Himmel
Geheiligt werde dein Name.
Dein Reich komme.
Dein Wille geschehe,
wie im Himmel, so auf Erden.
Unser tägliches Brot gib uns heute.

Althochdeutsch

Fater unseer, thu pist in himile,
uuihi namun dinan,
qhueme rihi din,
uuerde uuillo diin,
so in himile sosa in erdu.
prooth unseer emezzihic kip
uns hiutu,
oblaz uns sculdi unseero,
so uuir oblazem uns sculdikem,
enti ni unsih firleiti in khorunka,
uzzer losi unsih fona ubile.

Und vergib uns unsere Schuld,
wie auch wir vergeben unsern Schuldigern.
Und führe uns nicht in Versuchung,
sondern erlöse uns von dem Bösen.
Denn dein ist das Reich
und die Kraft und die Herrlichkeit
in Ewigkeit.

Mittelhochdeutsch

Got vater unser, da du bist in dem
himmelriche gewaltic alles des dir ist,
geheiliget so werde din nam,
zuo müeze uns komen daz riche
din.
Din wille werde dem gelich hie uf
der erde als in den himeln, des
gewer unsich.
nu gip uns unser tegelich brot und
swes wir dar nach dürftic sin.
Vergib uns allen sament unser
schulde,
also du wilt, daz wir durch dine
hulde vergeben der wir ie genamen
dekeinen schaden, swie groz er si:
vor sünden kor so mache uns vri
und loese uns ouch von allem
übele.

tooth and tongue
in the germanic languages
According to ASJP

0	AFRIKAANS	tant	toN
1	ALSATIAN	con	cuN
2	BERNESE_GERMAN	coN	cuNe
3	BRABANTIC	tant	tuN
4	CIMBRIAN	-	suNa-gaprext
5	DANISH	tEn7	toN3
6	DUTCH	tant	toN
7	EASTERN_FRISIAN	tan	-
8	ENGLISH	tu8	t3N
9	FAROESE	todn	tuNga
10	FRANS_VLAAMS	tant	tuN3
11	FRISIAN_WESTERN	tosk	toN3-toNg3
12	GJESTAL_NORWEGIAN	ton	toNa
13	GOTHIC	tun8us	tuNgo
14	ICELANDIC	thEn	thuNka
15	JAMTLANDIC	than	thuN
16	LIMBURGISH	tanty-tanC	toN
17	LUXEMBOURGISH	cant	coN
18	NORTH_FRISIAN_AMRUM	tus	toN
19	NORTHERN_LOW_SAXON	ten-tEn	tuN
20	NORWEGIAN_BOKMAAL	ton	t3N3
21	NORWEGIAN_NYNORSK_TOTEN	tEn	tuN3
22	NORWEGIAN_RIKSMAL	tan	tuNe
23	OLD_ENGLISH	to8	tuNe
24	OLD_FRISIAN	to8-tusk	tuN3
25	OLD_HIGH_GERMAN	cand	cuNa
26	OLD_LOW_FRANCONIAN	tand	tuNa
27	OLD_NORSE	ton	tuNga
28	OLD_SAXON	tant	tuNa
29	PLAUTDIETSCH	tan	tuN
30	SANDNES_NORWEGIAN	ton	toNa
31	SAXON_UPPER	con	cuN3
32	SCOTS	te8-ti8	toN
33	STANDARD_GERMAN	chan	chuN3
34	STELLINGWERFS	tan3	toN3
35	SWABIAN	can	cuN-cuNE
36	SWEDISH	tEnd	t3NE
37	WESTVLAAMS	tant	toN3
38	YIDDISH_EASTERN	con	cuN
39	YIDDISH_WESTERN	tson	tsung
40	ZEEUWS	tant	tuN3

Types of sound change

Lenition and fortition

Stronger Weaker

p	b
p	f
f	h
x	h
b	w
v	w
a	ə
d	l
s	r
k	?

a > e, ε > o > i, u > rhotics > laterals > nasals > voiced fricatives > voiceless fricatives > voiced stops > voiceless stops

Types of sound change

Lenition

Kara

*bulan > fulan 'moon'
*tapine > tefin 'woman'
*punti > fut 'banana'
*topu > tuf 'sugarcane'

Kara: Austronesian language

special case: rhotazism

Latin

*ami:ko:som > amicōrum 'of the friends'
*genesis > generis 'of the type'
*hono:sis > honōris 'of the honor'
*flo:sis > flōris 'of the flower'

Types of sound change

Lenition

- Subtypes

- **geminate** → **simplex** lat. *cuppa* → spn. *copa*
- **stop** → **fricative** lat. *habebat* → it. *haveva*
- **stop** → **liquid** eng. *water* → ae. *wa[r]er*
- **oral stop** → **glottal stop** eng. *water* → dialect *waʔer*
- **non-nasal** → **nasal** lat. *sabanu* → bsq. *zamau*
- **voiceless** → **voiced** lat. *strata* → it. *strada*

Types of sound change

Fortition

- much rarer than lenition, but still quite common
- subtypes:
 - **gemination** lat. *aqua* [akwa] → it. *aqua* [akkwa]
 - **denasalization** bsq. *musti* → dialct. *busti*
 - **devoicing** pie. *duo* → onrs. *tweir*
 - **fricative → stop**
 grm. *Wasser* → cmb. *basar*

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Prothesis
 - rather rare, mostly involves vowels
 - lat. *statu* → spn. *estado* 'state'

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Epenthesis

	Ukrainian	
*dérvo	> dérevo	'tree'
*soldŭ	> sólod	'malt'
*gordŭ	> hórod	'city'
*melko	> molokó	'milk'

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Paragoge

- mostly involves consonants after another consonant
- eg.
 - mengl. *amonges* → engl. *amongst*
 - ahg. *manin* → nhg. *Mond*

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Aphaeresis

		Angkamuthi	
*maji	>	aji	'food'
*nani	>	ani	'ground'
*ŋampu	>	ampu	'tooth'
*n̩ukal	>	uka:	'foot'
*yantu	>	antu	'canoe'
*wapun	>	apun	'head'

Angkamuthi: Australian language

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Syncope

Proto-North Sarawak

*eledaw > *eldaw

*baqeRu > *baqRu

*eRezan > *eRzan

‘new’

‘notched log ladder’

Sarawak: Austronesian language

Types of sound change

Sound loss and insertion

	Initially	Medially	Finally
Addition	prothesis	epenthesis	paragoge
Removal	aphaeresis	syncope	apocope

- Apocope

Southeast Ambrym

*utu	>	ut	'lice'
*ajo	>	aŋ	'fly'
*asue	>	asu	'rat'
*tohu	>	toh	'sugarcane'
*hisi	>	his	'banana'
*use	>	us	'rain'

Ambrym: Austronesian

Types of sound change

Metathesis

- change in the order of segments

- dt. *Brunnen*, ndl. *bron* – fries. *boarne*, nds. *born*
- dt. *Brust*, engl. *breast* – ndl. *borst*, nds. *bost*
- dt. *Christ*, *Christian* – ndl. *kerstmis*, *kerstenen*, *Karsten*, nds. *Kerst*, *Kerstin*, *Kir*
- dt. *Dorf*, nds. *dörp*, ndl. *dorp* – nds. *Bot-*, *Cas-*, *Finnen-*, *Frin-*, *Hön-*, *Sut-*, *Walt*
- dt. *Frosch*, engl. *frog* – ndl. *kikvors*, nds. *vorsch*
- dt. *Frost*, engl. *frost*, fries. *froast* – ndl. *vorst*
- nds. *frucht*, skand. *frygt*, engl. *fright* – dt. *Furcht*
- dt. *Jakob* – fries. *Jabik*, *Japik*
- dt. *Nadel*, engl. *needle*, fries. *nuddel* – ndl. *naald*
- dt. *Presse*, engl. *press* – ndl. *pers*
- dt. *Ross*, nds. *ros* – engl. *horse*, späteres nds. *ors*
- dt. *Warze*, engl. *wart* – ndl. *wrat*, nds. *wratte*
- dt. *brennen* – engl. *to burn*, nds. *bernen*
- dt. *dreschen*, nds. *dröschen* – ndl. *dorsen*, nds. *döschen*
- dt. *trennen* – ndl. *tornen*
- engl. *to wrestle* – ndl. *worstelen*
- dt. *dreißig*, norweg. *tretti*, fries. *tritich* – ndl. *dertig*, engl. *thirty*, nds. *dörtig*
- dt. *frisch*, engl. *fresh*, ndl. *fris* 'kalt' – ndl. *vers*
- dt. *Werk* – ndl. *gewrocht*, *doorwrocht*
- dt. *bersten* – ndl. *bres*
- dt. *Kreuz* – norweg. Bokmål *kors* (aber: norweg. Nynorsk. *kross*)

Types of sound change

Fusion, fission and breaking

- **Fusion**

- two separate sounds merge into one
- fairly frequent

	Attic Greek		Old Irish
*g ^w ous	> bous	'cow'	*magl- > ma:l 'prince'
*g ^w atis	> basis	'going'	*kenetlo- > kene:l 'gender'
*g ^w asileus	> basileus	'king'	*etno- > e:n 'bird'
*leik ^w o:	> leipɔ:	'I leave'	*ag-mo- > a:m 'a moving back and forth'
*je:k ^w ar	> hɛ:par	'liver'	

Types of sound change

Fusion, fission and breaking

- **Fission**

- one sound is split into two
- both inherit some features from original sound
- eg.
Imbrd. *balko(n)* (cf. grm. *Balken*) → fr. *balkon* [balkõ] → grm. *Balkon* [balkon]
- special case: vowel breaking (diphthongization)

		Kairiru	
*pale	>	pial	'house'
*manuk	>	mian	'bird'
*pamuk	>	niam	'mosquito'
*ranum	>	rian	'water'
*lako	>	liak	'go'

Types of sound change

Assimilation

- two (or more) sounds that occur close together (but not necessarily adjacently) become more similar
- highly frequent
 - It. *nocte* → it. *notte*
 - grm. **entfangen* → *empfangen*, **habte* → *hatte*
 - grm. Umlaut, eg.
ohg. *gastiz* → nhg. *Gäste*, ohg. *wurfil* → nhg. *Würfel*, ohg. *skoni* → ngh. *schöne*

Types of sound change

Assimilation

- especially common type: **palatalization**
- non-palatal sound becomes palatal before a front vowel
 - grm. *Kinn* – engl. *chin*
 - grm. *Kirche* – engl. *church*
 - It. *Cicero, Caesar, coeli, circus*: klassisch It. *[k]* → spätlt. *[ts]*

Types of sound change

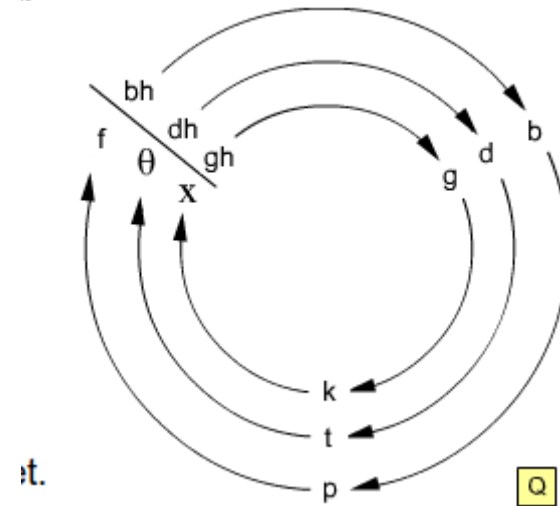
Chain shifts

- often different sound change processes are correlated
- a shift may lead
 - to an overcrowded slot in phonetic space, causing the original inhabitant to move away (push-chain), or
 - to a gap in phonetic space, which causes another sound to move into the empty space (pull-chain)

Types of sound change

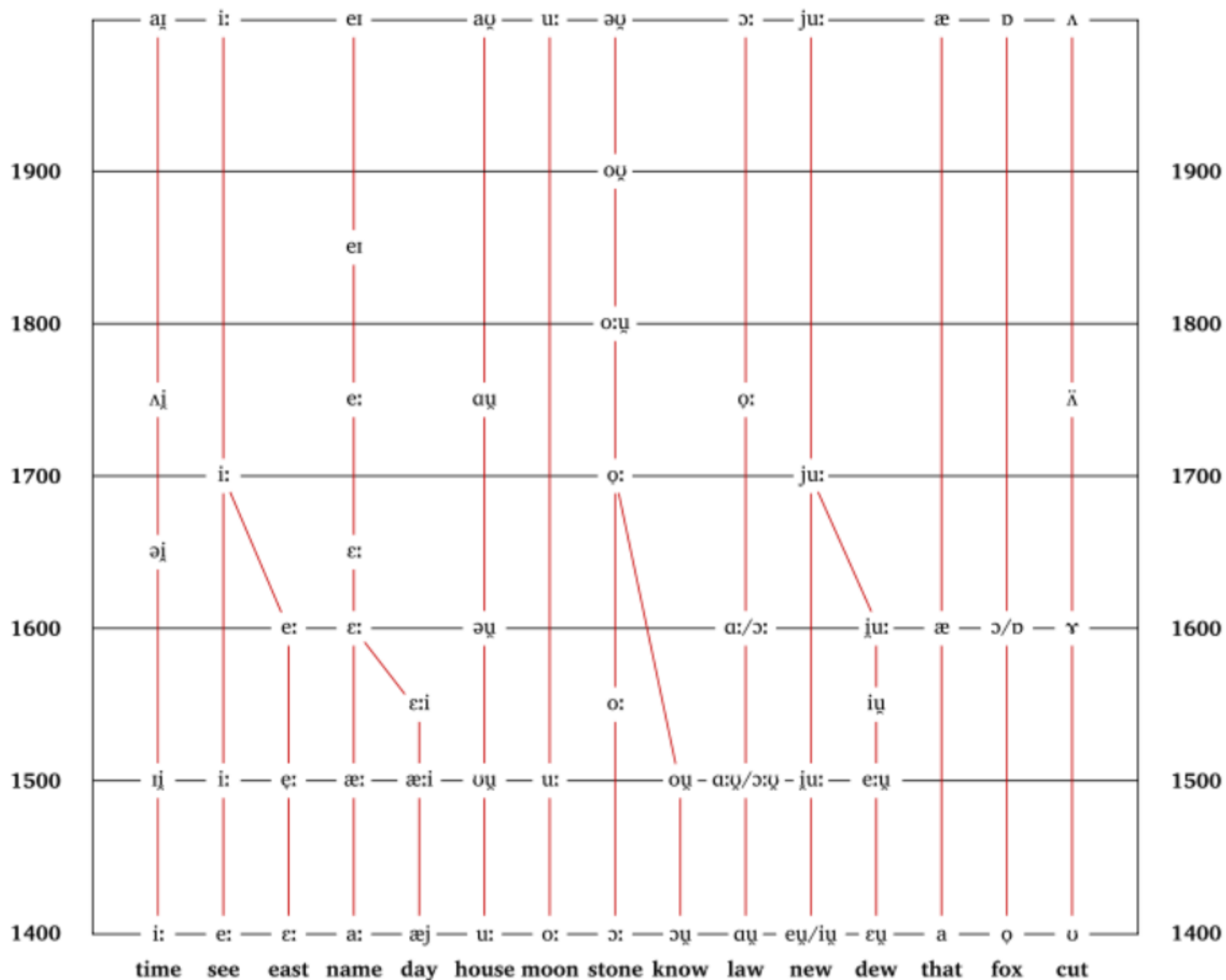
Chain shifts

- examples:
 - germanic sound shift



- English Great Vowel Shift

(a: →) æ: → e: → i: (→ əi) → ai und
 ɔ: → o: → u: (→ əu) → au



The regularity of sound change

- sound changes usually affect **all instances** of a sound, in all words of a language
- may be phonetically conditioned though
 - high German sound shift:

p/t/k → *f/s/x* between vowels and at the end of a word after a vowel (*water* → *Wasser*, *ik* → *ich*, *dat* → *das*)

p/t/(k) → *pf/ts/(kch)* in other contexts (*appel* → *Apfel*, *tegula* → *Ziegel*, *kind* → (Swiss Grm) *Kchind*)

The regularity of sound change

- Neogrammarians hypothesis:

*A sound **law** affects all words of the language for all speakers of the speech community at a specific point in time.*

- if we find an exception to a sound law, we have made a mistake
- attractive hypothesis for historical linguistics, because it allows reconstruction of older stages by running the sound laws backward

The regularity of sound change

- Grimm's law about sound change from PIE to Proto-Germanic:
 - $p \rightarrow \phi, t \rightarrow \theta, k \rightarrow x$
- however:
 - pie. *ph₂tēr* → pgmc. *fader* 'father'
 - pie. *b^hrātēr* → pgmc. *brōpēr*
- Verner's Law: *PIE voiceless stops become voiced in non-initial syllables if the preceding syllable is unstressed.*
- Explains why Grimm's law does not apply to 'father'.

The regularity of sound change

- This strategy – taking apparent exceptions as indicative of a yet undiscovered effect such as a preceding sound shift – proved highly successful.
- still, there is evidence that not all sound shifts are law-like in this sense:
 - metathesis is not law like
 - also other shifts may affect only parts of the lexicon (so-called lexical diffusion), cf.
 - ent-fangen* → *empfangen*
 - ent-fehlen* → *empfehlen*
 - ent-fachen* → *entfachen*
- still, most sound changes **are** regular, and it is a good heuristic to assume regularity if there is no evidence to the contrary

Lexical change

- a lexeme consists of a sound component and a meaning component
- as we saw, the sound component is apt to change
- so is the meaning component
- additionally, entire lexemes may be lost or added to a language

Semantic change

- frequent types of changes in word meaning:
 - **broadening:**
 - grm. *Fahrt* + *-ig* → *fertig*
 - original meaning: prepared for a trip
 - now: prepared, finished, exhausted,...
 - grm. *Sache*: original meaning 'legal issue'
 - engl. *ride*: originally 'riding on horseback'

Semantic change

- frequent types of changes in word meaning:
 - **split:**
 - engl. *gay*, originally 'cheerful', now additional meaning 'male homosexual'
 - *surfen*

Semantic change

- frequent types of changes in word meaning:
 - **narrowing:**
 - grm. *fahren*: originally: 'all kinds of human travel'
 - grm. *fällen*: originally 'cause to fall', applicable to all kinds of objects (not just trees)

Semantic change

- frequent types of changes in word meaning:
 - **meaning shift:**
 - *witzig* : 'smart' → 'funny'
 - *billig*: 'appropriate' → 'inexpensive' → 'low quality'
 - *Frau*: 'noble woman, lady' → 'female adult'; *Weib* 'female adult' → derogatory term
 - these are cases of pejoration; shift may also involve amelioration, cf. *marshall* 'staple boy' → 'highest military rank'
 - other frequent subtypes: metaphor, metonymy, implicature, hyperbole, folk etymology

Semantic change

- meaning change is much less orderly than sound change → harder to reconstruct
- still, there are certain regularities
 - common unidirectional cline
 - 'cup' → 'head' → 'chief'
 - 'something' → 'nothing'
 - verb of movement → directional preposition
 - verbs of possession or movement → auxiliaries
 - ...

Lexical change

- semantic change may lead to synonymy
- likewise, conventionalization of morphological processes like compounding may lead to synonymy
- synonymy is often unstable
 - either the two lexemes differentiate their meaning, or
 - one of the two lexemes goes extinct

Lexical change

- German words that are close to extinction:

abermals, blümerant, etepetete, frohlocken, garstig, hanebüchen, ingrimm, knorke, Labsal, schurigeln, Vetter, Base, Zierrat, ...

Lexical change

- sources of new lexemes:
 - semantic change (sometimes in combination with sound change)
 - morphology and syntax
 - shortening of existing words (to be distinguished from sound change); acronyms
 - **borrowing**

Loanwords

- most conspicuous effect of **language contact**
- may affect large portions of the lexicon of a language (cf. English, Romanian)
- mostly words for cultural concepts, but basic vocabulary may also be affected

engl. *their* ← onrs. *peir*

fin. *tytär* ← est. *tütar*

Loanwords

- loanwords undergo same sound shifts as inherited words

lat. *tegula* → ohg. *ziegal* → nhg. *Ziegel*

- after sufficient time, loan words are phonologically indistinguishable from inherited words
- major obstacle for identifying genetic relationships between languages

Language contact

- language contact affects all aspects of a language, not just its lexicon
- example: “Balkan-Sprachbund”
 - Albanian, Romanian, Bulgarian, Macedonian, Serbian and Greek share several grammatical features even though they belong to different sub-families of Indo-European
 - for instance: article after the noun, no infinitive constructions, periphrastic future with 'want'
- such **areal** phenomena are probably quite common
- may be hard to distinguish from features that indicate common descent