

# Diachronically distributed morphology: misparsing, reanalysis and the directionality of change

Laura Grestenberger  
Austrian Academy of Sciences  
Laura.Grestenberger@oeaw.ac.at

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'Change in syntax and phonology: the same or different?'

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# Introduction: Change & directionality

Directionality in syntactic change:

- ▶ **L1 acquisition + Computational economy/“Third Factor”**  
(Chomsky 2005) principles → directional change; syntactic “cycles”
  - ▶ Late Merge Principle (LMP) & Head Preference Principle (van Gelderen 2004, 2009, 2013...)
  - ▶ “Maximise Minimal Means”, Biberauer 2017, 2019, Biberauer and Roberts 2017
  - ▶ “Minimize Structure” (Cardinaletti and Starke 1999, Breitbarth 2017)

## Introduction: Change & directionality

Directionality in phonological change:

- ▶ **L1 acquisition** + “**misattribution**”/**misparsing** of (phonetic/transduction) features (Hale 2007; Hale et al. 2015); directionality in the case of “plausible endogenously–innovatable monoquantal N-CHANGES” (Honeybone 2016: 351) of the type  $\theta > f$  but  $f \not> \theta$

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So syntactic & phonological change are “the same” in that:

- ▶ Acquirers “misparses” the input/assign a different parse than the input grammar *at the computational* (rather than lexical item) level (“N-change”)
- ▶ The resulting change events are **directional**

Disclaimer: Today’s talk mostly about directionality in syntax/morphology

## What causes syntactic directionality?

► Van Gelderen's economy principles (e.g., 2004, 2009, 2013):

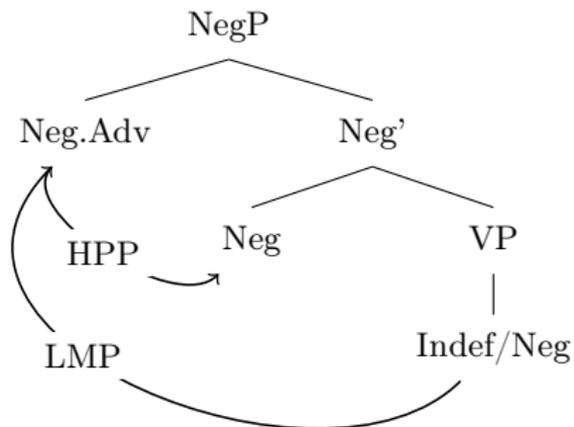
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- ▶ These derive the **directionality** observed in cycles like the negative cycle in (2), where elements descriptively move “up” the tree → “**Upwards Reanalysis**” (Roberts and Roussou 2003)

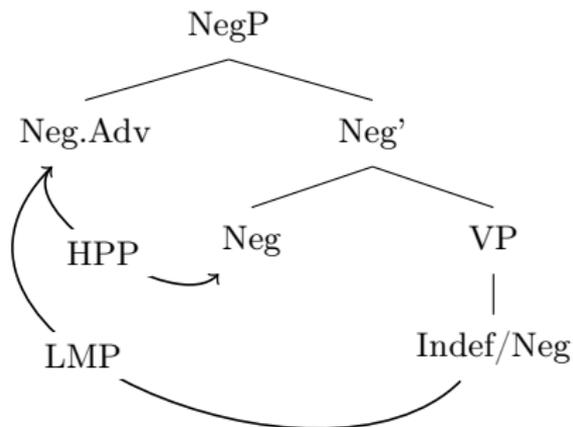
## Cyclical change

(2) van Gelderen (2008): The negative cycle



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- ▶ Evidence for UR/“overextension” in L1 acquisition (modal cycle):  
Cournane 2014, 2015 etc.

## Summary

- ▶ Syntactic change is cyclic and directional (material diachronically moves “upwards” the syntactic tree)
- ▶ **Upwards Reanalysis (UR)** describes a syntactic change event whereby L1 acquirers extend the available material to higher functional projections, beyond the use of the input grammar

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- ▶ Definition of **reanalysis**: purely descriptive, “a change event” (Walkden 2021); “(...) a process whereby the hearer assigns a parse to the input that does not match the structure assigned by the speaker.” (Walkden 2014: 39; also Hale 1998, 2007...)

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→ ... what about morphological change?

## Cycles in derivational morphology?

- ▶ This framework has successfully been applied to many of the phenomena that are traditionally described as “grammaticalization” (second compound member > suffix, clitic > affix, lexical verb > functional verb ...), e.g.:
- (3) Lat. *clarā mente* ‘with a clear mind’ > Fr. *clairement*, It. *chiaramente*, etc.;  
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    - ▶ Disclaimer III: Focus on changes in complex word forms because this is where different morphological theories make different predictions (more in a moment).

## Today's goals

### Core claims:

- ▶ Changes in categorizing/derivational morphology are directional, just like changes that are usually discussed under the label “syntactic change”
- ▶ The directionality follows from the same economy principles that have been argued to drive syntactic cycles of change → **reanalysis** (as defined above)
- ▶ But this only *follows* if we adopt a framework in which morphology mirrors/is mapped to (“realizes”) syntactic structure
  - ▶ **Distributed Morphology**
  - ▶ Nanosyntax
  - ▶ Exoskeletal approaches
- ▶ These mappings can change over time → “morphological change” = epiphenomenon that arises when acquirers end up with a different morpheme-to-node mapping than speakers of the input grammar
- ▶ ... but this mismapping/misattribution is not random.

# Distributed Morphology and morphological change

Why would morphological change be directional?

## Distributed Morphology and morphological change

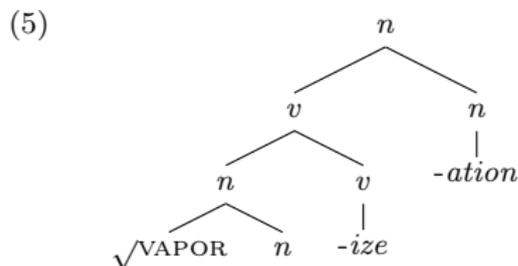
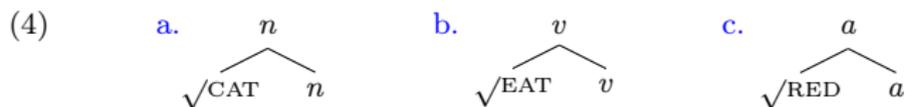
Why would morphological change be directional?

- ▶ In lexicalist approaches to morphology, word formation happens in the lexicon and there is no *a priori* reason why word formation changes should mirror syntactic changes.
- ▶ But in non-lexicalist, realizational approaches like Distributed Morphology (DM) or Nanosyntax, diachronic **reanalysis** like UR should in principle apply to “morphological” and “syntactic” changes equally.
- ▶ “Syntax” and “morphology” are not separate domains; morphology spells out or **realizes** functional heads (“terminal nodes”) built by the syntax.

... and if this is the case, directional “syntactic” changes like those driven by UR/the LMP should also be observable in the diachrony of complex word forms, specifically, in the diachrony of **derivational morphemes** and **categorizers**.

## Categorizers in DM

In DM, categorially unspecified **roots** combine with (overt/covert) categorizing heads “in the syntax”/via Merge:



- ▶ Where do new *v*'s, *n*'s, etc., come from?
- ▶ How do they change over time?
- ▶ ((How) do children *extend* the use of these elements during L1 acquisition?)

## Diachrony of categorizers

- ▶ If reanalysis/UR applies to derivational morphemes and, e.g., (modal) auxiliaries alike, we expect to see **“cycles” of derivational morphology**

(Expected) types of UR in derivational/categorizing morphology:

**I category change** in the context of cross-categorial derivation:

- $n > v$  (denominal verbs/unergatives)
- $v > n$  (deverbal nouns/nominalizer)
- $a > v$  (deadjectival verbs/unaccusatives)

**II change of derivational base** (no category change):

- ▶ *addition* of intermediate functional projections (descriptively UR) in semantically “enriched” or polysemous contexts.
  - denominal adjectivizer → deverbal adjectivizer
  - root-selecting  $v \rightarrow v$  / *Voice*-selecting  $v$  / *Asp* (reanalysis of verbalizers as *Voice* and/or aspectual markers)
- ▶ “loss of meaning” in some of these changes (Haspelmath 1995) → loss of formal features/functional projections.

## Reanalysis in lexicalist approaches

Some of the changes discussed here are also discussed/described in lexicalist/functionalist approaches, e.g., Haspelmath (1995)'s typology of morphological reanalysis:

- ▶ Affix telescoping
- ▶ Affix conglutination
- ▶ Affix secretion

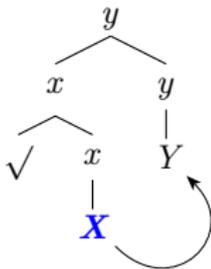
Haspelmath observes that there is an inherent *directionality* involved in these changes: While reanalysis of the type  $[XY][Z] \rightarrow [X][YZ]$  is amply attested, the opposite,  $[X][YZ] \rightarrow [XY][Z]$ , only occurs in the reanalysis of *roots* - it doesn't seem to give rise to new *affixes*.

- ▶ No explanation for directionality
- ▶ Cause of “affix growth” = compensation for “phonological erosion” (= sound change)

In the following, we will see that not all instances of affixal reanalysis lead to “longer” affixes, and not all instances are preceded by sound change/phonological erosion → a more complex typology of possible morphological reanalyses is needed.

# Types of UR

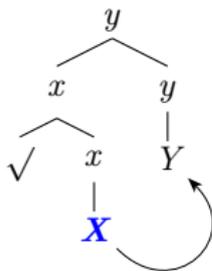
- 1) Category change, no loss of meaning (= functional projections)



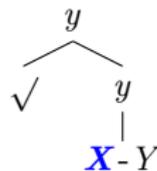
## Types of UR

2) Category change + loss of meaning (= loss of functional projections)

a.



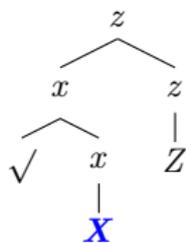
→ b.



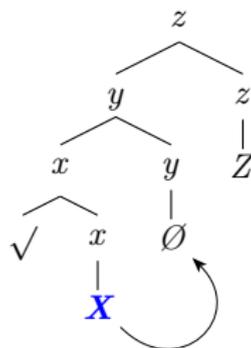
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## 3) Category change + addition of meaning (= FP)

a.



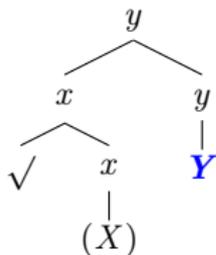
→ b.



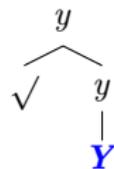
## Types of UR

4) No category change, loss of meaning (= of functional projections)

a.



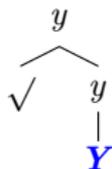
→ b.



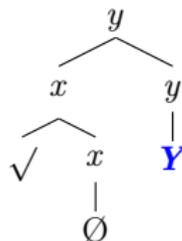
## Types of UR

5) No category change, addition of meaning (= of functional projections)

a.



→ b.



1) category change ( $n \rightarrow v$ ), no loss of meaning

Ancient Greek (AG) verbs in  $-éu-\bar{o}$  were originally derived from (agent-like) nouns in  $-éu-$  with the verbalizer  $*(j)e/o-$ , (6).

(6) AG verbs in  $-éu-\bar{o}$ 

AG verb in $-éu\bar{o}$		base	
<i>basil-éú-<math>\bar{o}</math></i>	‘am king; rule’	<i>basil-éú-s</i>	‘king’
<i>khalk-éú-<math>\bar{o}</math></i>	‘am a coppersmith’	<i>khalk-éú-s</i>	‘coppersmith’

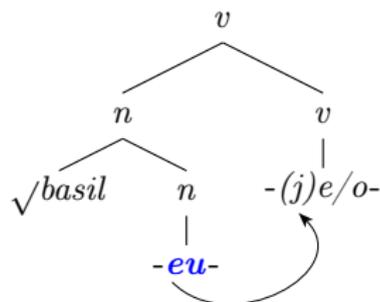
Nominal  $-eu-$  was reanalyzed and became a productive verbalizer in Modern Greek (MG), where it can select nouns, adjectives, adverbs and loanwords (Panagiotidis et al. 2017).

(7) Modern Greek verbs in  $-ev-$ 

MG $-ev-o$		base	
<i>stox-év-o</i>	‘I aim at’	<i>stóx-os</i>	‘target’
<i>kont-év-o</i>	‘I approach’	<i>kontá</i>	‘near’
<i>xak-év-o</i>	‘I hack’	Engl. <i>hack</i>	

1) category change ( $n \rightarrow v$ ), no loss of meaning

(8) UR : nominal  $-eu-$  + verbalizer  $(*)-je/o-$   $\rightarrow$  reanalyzed as part of  $v$ .



- ▶ The same type of reanalysis gave rise to a number of other MG verbalizers, e.g.,  $-iz$ ,  $-(i)az$ ,  $-on$ ,  $-ar$ ,  $-en$  (cf. Panagiotidis et al. 2017)
- ▶ “Conglutination” (Haspelmath 1995)

2) category change ( $v \rightarrow n$ ) + loss of meaning

UR + change of base: historical development of the MG action noun-forming suffix *-ismos* from earlier *-is-* (aorist verb stem) + noun-forming *-mós* (Schwyzer 1939: 493; Manolassou and Ralli 2015).

(9) Ancient Greek deverbal nouns in *-mós*

Present	Aorist	Deverbal noun
<i>oik-íz-ō</i>	<i>oik-is-a</i>	<i>oik-is-mó-s</i> ‘foundation of a colony’
house-PRES-1SG	house-AOR-1SG	house-AOR-NMLZ-NOM
<i>dane-íz-ō</i>	<i>dane-is-a</i>	<i>dane-is-mó-s</i> ‘money-lending’
loan-PRES-1SG	loan-AOR-1SG	loan-AOR-NMLZ-NOM

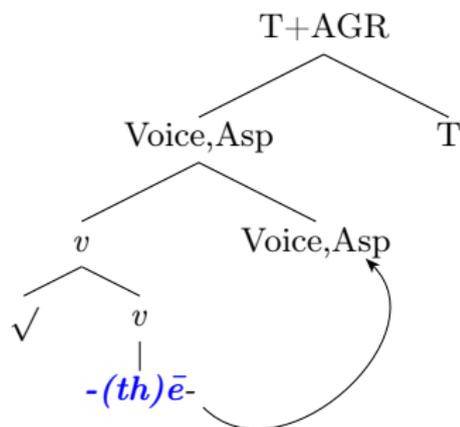
Hellenic to Modern Greek: *-ismos* = productive denominal suffix (*dogmat-ísmos*, *ergat-ísmos* ‘workerism’, *varoufak-ísmos* ‘Varoufakism’, ...)



## 3) category change + addition of meaning/FP

The AG inchoative/passive suffix  $-(th)\bar{e}-$  turned from a root-selecting suffix to a  $v$ -selecting one, realizing a fused Voice/Asp head in MG  
(Christopoulos and Petrosino 2018, Grestenberger 2021b, Alexiadou 2021).

(11) UR in AG passive aorists in  $-(th)\bar{e}-$ :



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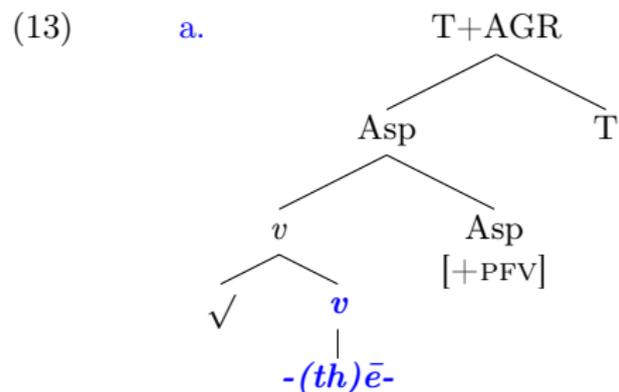
- ▶ Crucially, there is evidence that these verbs originally lacked VoiceP (Grestenberger 2021b):
  - ▶ They're inchoative/unaccusative rather than passive at the oldest stage, e.g., *e-rrú-ē-∅* 'flowed, streamed'; *e-pág-ē-∅* 'became fixed, coagulated', etc.
  - ▶ They compete for insertion with affixes that realize *v*/stem-forming morphology, not Voice/diathesis, (12).

(12) *-thē-* in complementary distribution with other *v*'s:

- a. *dú-n-ō*  
sink-**V.IPFV**-1SG.PRES.ACT  
'sink (sth.)'
- b. *é-dū-s-a*  
A-sink-**V.PFV**-1SG.PAST.ACT  
'sank (sth.)'
- c. *e-dú-thē-n*  
A-sink-**PASS.PFV**-1SG.PAST.ACT  
'was sunk'

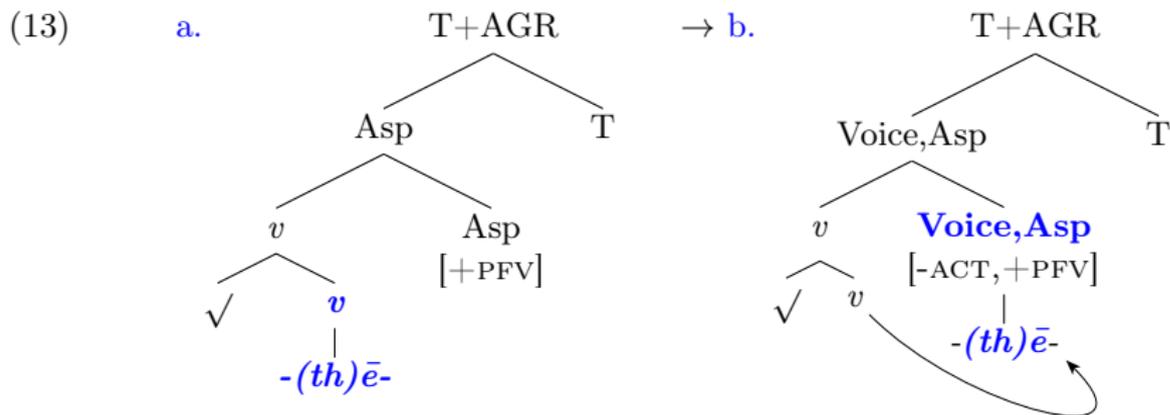
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But if Voice was originally missing from these verbs, (13a), this means that it must have been added at some point in order for *-thē-/MG -thi-* to become reanalyzed as realizing Voice[-act]/\_Asp[+pfv] (Merchant 2015) or [Voice,Asp] (Christopoulos and Petrosino 2018), (13b).



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## 3) category change + addition of meaning/FP

Another possible example: Reanalysis of Pre-Proto-Algonquian verbal nouns as stative verbs in predicative position/“verbless copular sentences” (Oxford 2014: 14–15; Goddard 1974, Proulx 1982)

- (14)
- a. Pre-Proto-Algonquian \* $[[api]_v-hm]_n$  ‘sitting place, seat’
  - b. Pre-Proto-Algonquian \* $net-[[api]_v-hm]_n-ena\cdot n$  ‘where we sit; our sitting place’ →
  - c. Proto-Algonquian \* $net-[[api]_v-hm]_{v?}-ena\cdot n$  (*ma·hi*) ‘we sit over there’

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- ▶  $n \rightarrow v$ ? Presumably addition of verbal functional projections in the new “independent order” in main clauses

*“even though the independent verb is not synchronically a noun, it is reasonable to suspect that some of its original nominal features may have been retained and may continue to exert an influence on its morphosyntactic behaviour”*

(Oxford 2014: 15)

## 4) No category change; loss of meaning/FP

Ancient Greek middle participle suffix *-menos* vs. Modern Greek passive *-menos* (Grestenberger 2020):

- ▶ AG *-menos* can be formed to any verb that inflects as nonactive in the finite forms, independent of its argument structure/valency → “**middle**” participle.
- ▶ AG *-menos* can be *transitive*

(15) AG *-menos* and finite verbs

	active	nonactive	<i>-menos</i>
alternating	<i>phér-ō</i> ‘carry’	<i>phéro-mai</i> ‘carry for myself’	<b><i>pheró-menos</i></b> ‘carrying for myself’
	<i>aíth-ō</i> ‘kindle’ (tr.)	<i>aítho-mai</i> ‘burn, blaze’ (itr.)	<b><i>aithó-menos</i></b> ‘burning, blazing’ (itr.)
<i>media tantum</i>	—	<i>keĩ-mai</i> ‘lie’	<b><i>keĩ-menos</i></b> ‘lying’
	—	<i>érkho-mai</i> ‘walk’	<b><i>erkhó-menos</i></b> ‘walking’
<i>activa tantum</i>	<i>ei-mí</i> ‘am’	—	—

## 4) No category change; loss of meaning/FP

MG *-menos*:

- ▶ only combines with the perfective stem  $\approx$  “perfect passive participle”.
  - ▶ formally continues AG perfect/aorist participles after the collapse of the distinction by Early Modern Greek (Holton and Manolessou 2010).
- ▶ forms exclusively *passive* participles.
- ▶ combines with morphologically active or nonactive verb stems (valency relevant, not voice morphology):

(16) MG *-menos* and its base verbs (present stem)

	verb	meaning	participle	meaning
active	<i>agapo</i>	‘love’	<i>agapi-ménos</i>	‘loved’
	<i>deno</i>	‘tie’	<i>de-ménos</i>	‘tied’
	<i>kalo</i>	‘call’	<i>kales-ménos</i>	‘called’
nonactive	<i>metahirizome</i>	‘use’	<i>metahiris-ménos</i>	‘used’
	<i>varieme</i>	‘am bored’	<i>variesti-ménos</i>	‘bored’
	<i>ekmetalevome</i>	‘exploit’	<i>ekmetalev-ménos</i>	‘exploited’

## 4) No category change; loss of meaning/FP

Evidence for loss of FP (VoiceP): Alexiadou, Anagnostopoulou & Schäfer 2015: 159: “the target state construal of participles is blocked in the presence of Voice in Greek, which forces a resultant state interpretation.”

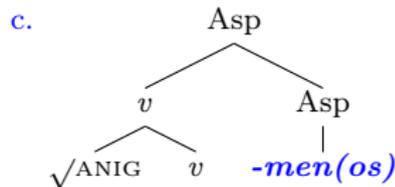
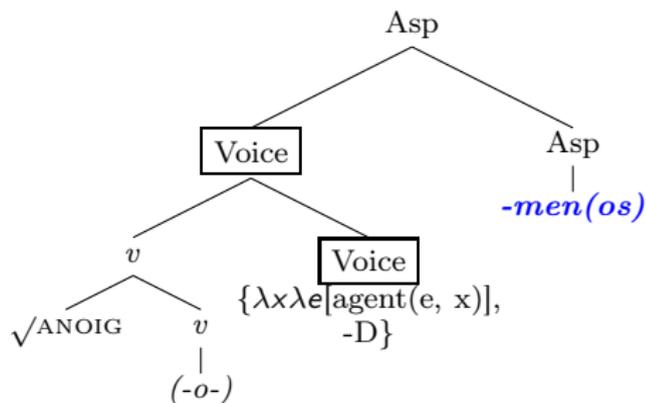
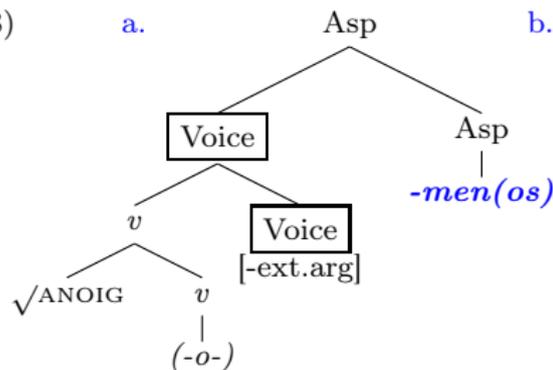
- ▶ *-menos*-participles that are modified by *akoma* ‘still’ (= target state participles) are incompatible with agent *by*-phrases, while resultant state participles are fine with them:

- (17) *Ta lastiha itan (\* akoma) fusko-mena apo tin Maria*  
 the tires were ( still) inflate-PTCP by the Maria  
 “The tires were still inflated by Maria” (Anagnostopoulou 2003: 22)

Assuming passive *by*-phrases are merged in Spec.VoiceP (Bruening 2013), MG target states do not include VoiceP.

## 4) No category change; loss of meaning/FP

(18)



**a.** AG “middle” *menos*-ptcp (selects Voice); **b.** AG/postclassical perfect passive ptcp/MG resultant state ptcp (selects Voice{agent,-D}); **c.** MG target state ptcp (selects *v*).

## 5) no category change; addition of meaning/FP

Vedic Sanskrit (VS) *-ín-*, originally a possessive denominal suffix, (19a), that was reanalyzed as a deverbal (participial) suffix to morphologically characterized verbal stems (including preverbs), (19c), starting from contexts that were ambiguous between a denominal and a deverbal (state-denoting) interpretation, (19b) (Grestenberger 2021a).

(19) Vedic denominal/deverbal adjectives in *-ín-*

- |    |  |   |
|----|--|---|
| a. | <b><i>n</i></b> → <b><i>a</i></b><br><i>dhána-</i> ‘prize’<br><i>parṇá-</i> ‘wing, feather’  | <i>dhan-ín-</i> ‘possessing prizes’<br><i>parṇ-ín-</i> ‘winged, feathered’                                      |
| b. | <b><i>n?</i></b> / <b><i>v?</i></b> / <b><i>√?</i></b> → <b><i>a</i></b><br><i>kārá-</i> ‘praise song’/ <i>kar</i> ‘praise’<br><i>vi-rapśá-</i> ‘abundance’/ <i>vi rapś</i> ‘abound’ | <i>kār-ín-</i> ‘praising’<br><i>vi-rapś-ín-</i> ‘having abundance’  |
| c. | <b><i>v</i></b> → <b><i>a</i></b><br><i>ví<sub>PRVB</sub> car</i> ‘wander off’<br><i>ní<sub>PRVB</sub> ram</i> + loc. ‘stay at’<br><i>prá<sub>PRVB</sub> sak-ṣ</i> ‘conquer’         | <i>vi-cār-ín-</i> ‘wandering off’<br><i>ni-rām-ín-</i> + loc. ‘staying at’<br><i>pra-sak-ṣ-ín-</i> ‘conquering’ |

## 5) no category change; addition of meaning/FP

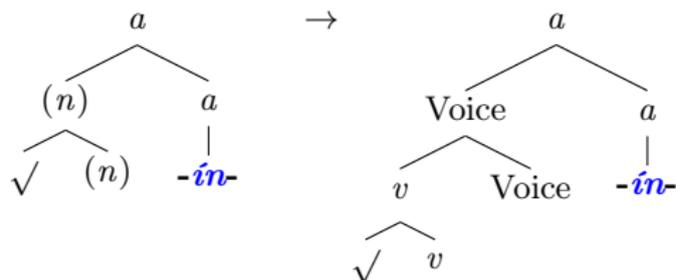
Evidence for reanalysis of *-ín-* as “deverbal” ( $\approx$  participial) suffix: ability to occur with accusative objects, e.g., (20).

- ▶ This suggests the presence of *v*/Voice to license object case

(20) *kāmī́ hí vīráḥ sádam asya pītīm*  
 love.**ín**.NOM.SG because hero.NOM constantly his **drink**.ACC.SG  
 “because the hero is ever desirous of his drink” (RV 2.14.1c; transl.  
 Jamison and Brereton 2014)

(Lowe 2017; Grestenberger 2021a)

## 5) no category change; addition of meaning/FP

(21) UR of Vedic adjectives in *-ín-*

## Summary

	no change in selected FP	FP lost	FP added
category change of reanalyzed affix	1) AG <i>-euō</i> → MG <i>-evo</i> ; “conglutination”; “secretion”	2) AG <i>-is-mos</i> → MG <i>-ismos</i> ; “telescoping”	3) AG <i>-(th)ē-</i> → MG <i>-thi-</i> ; Proto-Algonquian independent order
no category change of reanalyzed affix	(= no change)	4) AG middle <i>-menos</i> → MG passive <i>-menos</i> (target state)	5) Ved. <i>-ín</i> (denom. → deverbal)

## More examples:

- ▶ for 3): Gm. nominal diminutive *-(e)l-* → Austro-Bav. verbal diminutive *-(e)l-* (Grestenberger and Kallulli 2019); reanalysis of frequentative *v* as middle Voice head in Hungarian (Halm 2020)
- ▶ for 4): PIIr. *\*-ka-* (nominal dim.; genitival) → East Middle Ir. (Khotanese, Bactrian...) unmarked nominalizer *-k(a)-* (?)
- ▶ for 5): PIE *\*-nt-* denominal/possessive adjective → *active* participle in “Core IE” languages (Grestenberger 2020); Gmc. adjectival passives/verbal adjectives (*\*-to-/\*-no-*) → English, German ... verbal passives/PPPs (Wegner 2019, Hallman 2021)

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- ▶ But in the other examples, specifically the ones involving *addition* of meaning and functional/argument structure (Ved. *-ín-*, MG *-ismos*, MG *-thē-*) there is no “phonological erosion” at all.

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- ▶ So sound change is not even a “necessary but not sufficient” trigger for reanalysis, unlike (maybe) for (certain types of) syntactic change (Haerberli 2002).
- ▶ Therefore reanalysis cannot be causally related to “compensation of phonological reduction” (*pace* Haspelmath 1995)

## Why UR?

How does UR fare in comparison to other “mechanisms” in the diachronic morphology/morphosyntax-“toolbox”?

- ▶ **Grammaticalization** (Hopper and Traugott 2003; Joseph 2001, etc.):
  - ✓ predicts directional change
  - ✗ usual criteria (semantic bleaching, phonological weakening, change in discourse status...) do not apply to the changes in categorizing affixes described above.
- ▶ **Analogy/analogical extension** (e.g., Arndt-Lappe 2015, Rainer 2015):
  - ✗ doesn't predict directionality
  - ✗ no similarity in form/meaning that could account for “new uses” of the target suffixes (cf. Haspelmath's criticism)
- ▶ **Resegmentation/affix telescoping/conglutination** (Haspelmath 1995)
  - ✗ do not predict directionality (also pointed out by Haspelmath)
  - ✗ not necessary that phonological reduction, the putative trigger for “affix growth”, precedes reanalysis
  - ✗ do not predict the cases in which there is no category change

## Conclusion

- ▶ A piece-based, “syntactocentric” model of word-formation in which syntactic structure maps to morphological structure (e.g., DM) allows us to extend principles of syntactic change like UR to changes in word structure and make testable predictions w.r.t. the directionality of these changes
  - ▶ in the historical record (✓)
    - ▶ Urgent desideratum: Extend the proposed typology to non-IE languages
  - ▶ during L1 acquisition (to be tested)
- ▶ To the extent that the principles behind these changes are also at work in syntactic and phonological change, morphological change doesn't need domain-specific explanatory devices — in that sense it is “the same” as syntactic and phonological change.
- ▶ To put it more dramatically: morphological change (in the sense discussed here) can be reduced to syntactic change.

Thank you!



FWF V850-G “The diachrony of verbal categories and categorizers”



## Appendix: root extension

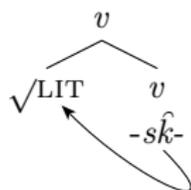
Possible cases of “root extension”:

- ▶ Tocharian “*tk*-roots” < PIE roots ending in dental stop + stem forming suffix  $*-s\hat{k}(e/o)-$  (Melchert 1978; Malzahn 2010: 460ff.);  $*-Tsk-$  >  $*-Tk-$

Toch.	meaning	etymology
A <i>yutk</i> <sup>ā</sup> -	‘be worried’	$*H\hat{i}ud^h-s\hat{k}e/o-$
<i>litk</i> <sup>ā</sup> -	‘avert, remove’	$*l\hat{i}t-s\hat{k}e/o-$
<i>wätk</i> <sup>(ā)</sup> -	‘decide’	$*u\hat{i}-d^h h_1-s\hat{k}e/o-$
<i>nätk</i> <sup>ā</sup> -	‘push away’	$*n\hat{u}d-s\hat{k}e/o-$

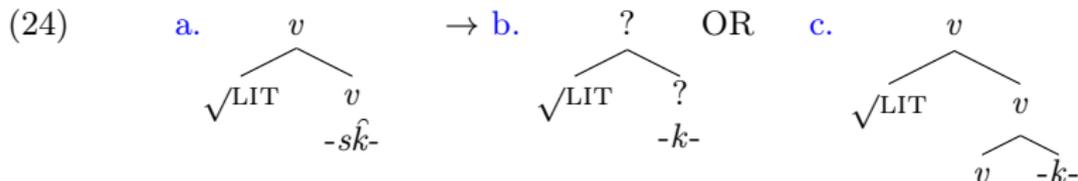
≈ 25 in total.

(23)



## Appendix: root extension

- ▶ Koller (2008: 25ff.) argues that *-tk-* (and *-Cw-*) roots violate the synchronic phonotactic rules of Tocharian, and provides arguments that these ““roots” are actually morphologically complex structures” (p. 27)
  - ▶ “Root extensions” or “root augmentation”
  - ▶ Cf. Anagnostopoulou and Samioti 2014, Bertocci 2017, Calabrese 2019, Grestenberger 2022 ... for further possible examples of (reanalyzed) “root augmentation”/thematic formants in Latin and MG.
  - ▶ Theme vowels as adjuncts to FP: Oltra-Massuet 1999, Oltra-Massuet and Arregi 2005; cf. (24c).



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