Entry title: Morphological reanalysis: recycling old form to new function

First author: Full name and affiliation; plus email address if corresponding author
Laura A. Janda, UiT The Arctic University of Norway, laura.janda@uit.no

Word Count
9670

Abstract
Morphological reanalysis yields grammatical morphemes by means of bleaching, metonymy, and metaphor. While this process does not itself create new forms, the resulting morphemes are often subsequently spread by analogy. Since both lexemes and grammatical morphemes can be subject to morphological reanalysis, it is theoretically possible for this process to take place recursively and to be unrestricted in direction. However, the maximum length of a morphological reanalysis chain seems to be just two steps, for example from body part (like 'backside') to location/trajectory (like 'backward') and from location/trajectory to temporal marker (like 'ago'). Morphological reanalysis is furthermore strongly directional: I find only one example of a bi-directional pathway for semantic shift. In order to give some indication of the range of morphological reanalysis, I suggest viewing the phenomenon from two dimensions: the semantic shift as typical ("on-track") vs. atypical ("off-piste"), and the status within the given language as solitary (an isolated change) vs. convergent (resulting in a grammatical system). These dimensions are not envisioned as discrete, rather they are devices that highlight the variety of morphological reanalysis. I present three types: the on-track solitary type is illustrated by isolated changes that are typologically common, the on-track convergent type is illustrated by the evolution of classifier systems for both nouns and verbs, and the off-piste solitary type is illustrated by examples of exaptation in which morphemes left behind by language change shift their meanings across grammatical categories.

Keywords
morphological reanalysis, semantic change, grammaticalization, analogy, exaptation, typology, metaphor, metonymy, bleaching

Main text
1. The scope of morphological reanalysis
Morphological reanalysis is a diachronic linguistic process that enriches the morphology and grammatical categories of a language. "Morphological" indicates that the outcome is a morpheme, more specifically a grammatical form such as a function word (e.g., adverb, conjunction, adposition, or clitic) or a bound derivational or inflectional marker. "Reanalysis" means a change in how an item is understood, a reinterpretation of the function and meaning of an item. We leave aside a different diachronic phenomenon that unfortunately shares the term "reanalysis", namely change in the position of morpheme boundaries, as in English *a napron* > *an apron* (See WBCDL023 and WBCDL031). In this article, we focus exclusively on the emergence of grammatical

meanings. Let's work toward a definition of morphological reanalysis via an illustration with a concrete example.

The Russian word *zad* 'back(side)', the name for a body part, as in (1a), provides a typical progression of morphological reanalysis. Our presentation of this change as a sequence of two steps is a simplification of a process that was certainly gradual and more complex. In (1a) *zad* 'back(side)' is an ordinary noun, here in the Accusative Singular case governed by the preposition *na* 'on(to)'. In other contexts, this noun can take other inflectional endings, such as *-om* which indicates Instrumental Singular, as in *s golym zadom* 'with a bare backside'. Together the preposition and noun in (1a) form a single stress unit phonologically indistinguishable from *nazad* in (1b) 'back (spatial direction)' and in (1c) 'ago'. In (1b) and (1c) *nazad* is a morpheme that cannot be inflected. In (1b) *nazad* [onto-back] is reanalyzed as a spatial adverb meaning 'back (to place of origin)'. In (1c) *nazad* is further reanalyzed as a temporal postposition meaning 'ago'. Examples (1a-c) are cited from the Russian National Corpus (ruscorpora.ru).

(1a) Russian *zad* 'backside (body part)'
Paren' *u-pa-l* *na* *zad*
[boy.NOM.SG down-fall-PST.M.SG on backside.ACC.SG]
'The boy fell on his backside.' [Zaxar Prilepin. San'kja (2006)]

(1b) Russian *nazad* 'back (spatial direction)'
I *potomu* *mnog-ie* *iz* *nix*
[and why many-NOM.PL from 3PL.GEN

mečtaj-ut *vernu-t'-sja* *nazad.*
dream.PRS-3PL return-INF-REFL back]
'And that's why many of them dream of going back.' [Žizn' nacional'nostej, 18.06.2003]

(1c) Russian *nazad* 'ago'
8 let nazad ja pere-exa-l v Gamburg.
[8 year.GEN.PL ago 1SG.NOM TRANSFER-ride-PST.M.SG to Hamburg.ACC]
'8 years ago I moved to Hamburg.' [Byli vy v strane prepodavaemogo jazyka? (2008-2011)]

These examples illustrate two instances of morphological reanalysis, one from (1a) to (1b) and one from (1b) to (1c). Following the conventions of Heine and Kuteva (2002), we will analyze both instances in terms of Sources and Targets for function and meaning.

Function
The Source *zad* 'back(side)' in (1a) functions as a nominal lexeme that can be inflected. In (1b) *nazad* 'back (spatial)' is a morpheme that is both the Target of the first morphological reanalysis and the Source of the second one. Overall, the functional direction is toward increased grammaticalization. This change is also known as "decategorialization", the loss of morphosyntactic properties associated with less

grammatical lexemes (Heine and Kuteva 2002: 2). The Target of morphological reanalysis is always a morpheme.

Meaning
The Source meaning in (1a) is a concrete part of the body. The Target meaning in (1b) takes advantage of the body's front vs. back asymmetry, abstracted to a generalized direction. This Source to Target shift is motivated by metonymy since a human who moves in the direction of the front of the body goes forward, but if they move in the direction of the backside, they go backward. The backside is thus metonymically associated with a backward direction. A metaphorical extension from space to time in the shift from (1b) *nazad* 'back (in space)' to (1c) *nazad* 'ago, back (in time)' is motivated by the fact that all locations and movements take place in time, facilitating a mapping from the spatial to the temporal domain that is well-documented cross-inguistically. In a study of fifty-three languages sampled to represent the diversity of language families in the world, Haspelmath (1997) found parallels between grammatical markers for spatial and temporal relationships in all of them, and concludes that while the details certainly differ, it is likely that all languages take advantage of spatial concepts in order to express temporal concepts. In sum, in morphological reanalysis the meaning of a unit shifts from the Source to the Target. This meaning shift usually involves increased abstraction, also termed "desemanticization" or "semantic bleaching" (Heine and Kuteva 2002: 2), and often a metaphorical or metonymic extension. Morphological reanalysis thus achieves a meaning more typical of a grammatical category.

Based on these observations, we can define morphological reanalysis as in (2).

(2) Morphological reanalysis is a diachronic process of Source to Target shifts, involving both function and meaning. Functionally the trend is toward increasing grammaticalization and the Target is a morpheme. Meaning typically becomes more abstract, often motivated by metaphor and metonymy.

The word "trend" in (2) is deliberately chosen to describe typical cases of morphological reanalysis. Language diachrony is sufficiently messy to ensure that any absolute definition would be vulnerable to counterexamples. The remainder of this article explores phenomena related to morphological reanalysis, typical cases of morphological reanalysis, and more unusual examples at the margins of morphological reanalysis.

From a wider perspective, two further parameters can be considered in connection with morphological reanalysis: the trajectory of the meaning shift and the status of the change as a solitary vs. systematic phenomenon. The meaning shifts of (*na* +) *zad* ' (onto) backside' > *nazad* 'back(ward)' > *nazad* 'ago' in (1a-c) follow a rather standard trajectory in which a location on the body motivates extension to a path and a spatial meaning is further mapped onto the temporal domain. These are meaning shifts that "stay in their lane". Occasionally morphological reanalysis strays "off-piste" and we observe more unusual meaning shifts, such as a jump from one grammatical category to another category that is not commonly related, for example when a morpheme that

once signaled number comes to express gender (see Section 5). Language internally the morphological reanalyses in (1a-c) are isolated events. These changes are unique to a single linguistic unit. One-off diachronic events like these are usually of less interest to linguists unless typological comparisons can be drawn, but in this case (and many others), similar shifts are indeed found cross-linguistically (see Section 4). By contrast, sometimes we observe morphological reanalysis that is convergent in the sense that a whole group of linguistic units undergo a similar reanalysis and thereby foster a new grammatical structure in the language (see Section 5).

The context for this exploration is set in Section 2, devoted to grammaticalization as contrasted with degrammaticalization and analogy. Section 3 presents arguments for abduction as the logical mechanism of morphological reanalysis, motivated by metonymic and metaphorical extensions. Sometimes, prior or ongoing historical change that precipitates the loss of grammatical categories or paradigms can facilitate abduction by freeing up morphemes for reanalysis; this scenario is often referred to as "exaptation". If we classify events of morphological reanalysis according to the trajectory of meaning shift and solitary vs. systematic status, we observe three types, and a case study of each is presented: on-track solitary (Section 4), on-track convergent (Section 5), and off-piste solitary (Section 6). Conclusions are offered in Section 7.

2. Grammaticalization, degrammaticalization, and analogy

We can contextualize morphological reanalysis in relation to the superordinate process of grammaticalization, the inverse process of degrammaticalization (See WBCDL025), and analogy (See WBCDL017 and WBCDL081) as a process that is often linked with morphological reanalysis.

Grammaticalization

Morphological reanalysis is part of the larger phenomenon of grammaticalization, defined by Hopper and Traugott (2003: 1) as "how lexical items and constructions come in certain linguistic contexts to serve grammatical functions or how grammatical items develop new grammatical functions". Both morphological reanalysis and the emergence of grammatical constructions (e.g., the English future *going to* + *INF*) fit under the umbrella of this definition of grammaticalization (Bybee 2015: Chapter 6). The boundary between the grammaticalization of constructions, also known as "constructionalization", and morphological reanalysis can be indistinct, especially when a construction is reduced to a single morpheme, as in Old English *þa hwile þe* 'that time that' > *hwile* 'while' where a phrase was consolidated as a construction with the function of a temporal connective and then eroded to a single function word (Hopper and Traugott 2003: 4).

Morphological reanalysis typically involves a step along a grammaticalization cline that starts from a referential lexeme and progresses to more and more grammatical morphemes and may eventually be eclipsed by phonological erosion, visualized in (3).

(3) Grammaticalization cline (also known as grammaticalization "channel" or "chain"; Hopper and Traugott 2003: 6)

lexeme > morpheme > morpheme > … > Ø

The sequence in (3) presents the maximal possible shape of a grammaticalization cline. None of the steps in (3) is predictable or obligatory, though every step is usually motivated by associations of meaning that arise in context, especially when an item is spread to a wider variety of contexts that support meaning shifts (see Section 3). The process of grammaticalization does not have to begin with a lexeme; it may begin with a morpheme. Progress along the grammaticalization cline may stall at any point, with no need to proceed to another step. Erosion at the endpoint is a symptom, not a part of grammaticalization strictly speaking, and it may be partial or complete.

Degrammaticalization
The opposite direction of change, namely degrammaticalization, is also possible, though less frequently attested. Examples (4a-b) and (5a-b) illustrate changes in which grammatical morphemes have been reinterpreted as lexemes capable of nominal inflection.

(4a) Czech *bych* as conditional morpheme

Uděla-l	*by-ch*	*to,*	*kdy-by-ch*	*mě-l*	*čas.*
[do-PST.M.SG	COND-1SG	that	if-COND-1SG	have-PST.M.SG	time.ACC.SG]

'I would do it if I had time.'

(4b) Czech *bych* as lexeme 'I would have'

pozdě	*bych-a*	*hon-it*
[late	I.would.have-ACC.SG	chase-INF]

'what's done is done / it's too late to chase after "I would have"'

(5a) North Saami *-naga* as contaminative (CONT) morpheme

Albas-a	*gorut*	*lei*	*varra-naga*
[lynx-GEN	carcass.NOM	be.PST.3SG	blood-CONT]

'The lynx carcass was stained with blood' [Ylikoski 2016, 130]

(5b) North Saami *-naga* as second element in a compound noun

Varra-naga-t	*oidnoj-it*	*ja*	*rumbbu-t*	*nu duokkot dákko*
[blood-stain-NOM.PL	be.visible-3PL	and	carcass-NOM.PL	here and there]

'Blood stains and carcasses can be seen here and there.' (Ylikoski 2016, 142)

The sentence in (4a) presents the most common and neutral use of Czech *bych*, namely as the conditional auxiliary verb inflected for first person singular, indicating what the speaker would do or would have done. This function word has been degrammaticalized and interpreted as a noun in the Czech saying in (4b), where *bych* acquires a case inflection possible only for nouns. Here *-a* is a facultative animate accusative singular ending, presumably motivated by the fact that it is normally only animate entities that are chased (for more on facultative animacy in Czech and other Slavic languages, see Janda To Appear a). North Saami has developed a "contaminative" morpheme *-naga*, probably derived from an essive case, as in (5a). This grammatical morpheme has been

degrammaticalized into a noun meaning ‘stain’ that can take case and number endings, as in the compound noun in (5b) (Ylikoski 2016).

Analogy

Analogy is in many respects orthogonal to morphological reanalysis. Whereas morphological reanalysis is the extension of a form to a new function and meaning, analogy is the spread of a form with the same meaning to new contexts. Whereas morphological reanalysis is syntagmatic, taking place in a syntactic context, analogy is paradigmatic since it defines the choice of form that is made. Morphological reanalysis is a covert process, often made overt only by analogy. Morphological reanalysis can be thought of as the bottom side of a same coin that is invisible, while analogy is the side on the top that is visible.

Reanalysis and analogy can feed each other in cycles as we see in the history of negation in French. At one point the lexeme *pas* ‘step’ was added as an intensifier to negated motion verbs, in the sense of ‘not to go a step further’. Reanalysis transformed *pas* into a morpheme that functioned as part of a negation marker *ne…pas* ‘not’. Analogy then spread this negation marker to other verbs. Reanalysis shifted the focus of negation primarily or even exclusively to *pas*, rendering *ne* redundant. Today analogy is at work again in spreading the loss of *ne*, with the result that verbs can be negated by *pas* alone, as we see in the title of a song recorded in 1995 by Celine Dion *Je sais pas* ‘I don’t know’ (lyrics by Jean-jacques Goldman and J. Kapler).

Both morphological reanalysis and analogy are motivated by the logical process of abduction described in the next section.

3. Motivation via abduction

Charles Sanders Peirce (1903) distinguished three types of logical inference, which we can briefly characterize as follows:

- *Deduction* is when you start with a given rule and apply it as appropriate. For example, if you are told that masculine nouns in language X have a plural ending *-r* and feminine nouns have a plural ending *-s*, then you will add *-r* to make plurals of masculine nouns and add *-s* to make plurals of feminine nouns.
- *Induction* is when you are given sufficient data to figure out what the rule is. For example, you get plenty of examples of masculine nouns with *-r* plural forms and plenty examples of feminine nouns with *-s* plural forms and you derive the rule.
- *Abduction* is when you have some observations and make a guess about a possible rule. If the sample you have presents predominantly masculine nouns, you might guess that *-r* is the most likely plural marker and you might then use *-r* with all nouns.

Deduction and induction are direct lines of reasoning that ensure continuation of identical patterns. However, these types of reasoning would prevent language change from ever occurring. It has been repeatedly argued that the mechanism of language change involves the “quick and dirty” reasoning of abduction (Andersen 1973, Hopper and Traugott 2003: 41–44). In the hypothetical example above, the language user who

uses abduction guesses at a pattern that motivates analogical spread of the *-r* plural marker.

Abduction can also motivate morphological reanalysis. Abductive guesses that connect a location with a direction, first in space and then in time, provide the logic for the morphological reanalyses in examples (1a-c). Similarly, an abductive generalization from the belly as a container to other containers motivates the extension of 'belly' as a body part to a preposition with the meaning 'in' in various languages, as shown in (6), often with a further mapping from spatial to temporal 'in'. The examples in (7) illustrate a morphological reanalysis that starts from a morpheme, namely a spatial Ablative marker 'from', with a semantic extension to Partitive since something that is taken from a set is necessarily a subset, a part of a set. Examples in both (6) and (7) are extracted from Heine and Kuteva 2002.

(6) 'belly' > 'in' (spatial) > 'in' (temporal)
Hausa *cikì* 'belly' + *-n* determiner > *cikin* 'in, inside, within'
Swahili **nda* 'stomach' + *-ni* locative > *ndani* 'in, inside'
Mixtec *ini* 'stomach' > 'in'
Albanian *bark* 'belly' > 'inside' > 'in (temporal)'

(7) Ablative > Partitive
French *de* 'from' preposition > Partitive marker
German *von* 'from' preposition > Partitive marker
Finnish Ablative *–tA* > Partitive

Metonymy and metaphor
The logical leap of abduction tends to coincide with opportunities for language users to make new guesses about form-meaning relationships in their languages. Such opportunities may arise when a meaning appears to be ambiguous and/or a form seems to have lost its mooring in a paradigm. Perhaps the most widespread and also most overlooked ambiguities are those created by the relationships of contiguity and mapping that underlie metonymy and metaphor (cf. Bybee 2015: Chapter 6). As mentioned above (Section 1), metonymy opens the possibility for the shift from a body part in *na zad* 'onto the backside' to *nazad* 'backward (in space)' in (1a-b). This is more specifically a metonymic relationship between an endpoint and a path, and similar logic connecting grammatical markers of spatial relations is very common typologically (cf. numerous examples in Heine and Kuteva 2002). Endpoint-path metonymy is itself a specialized version of the more schematic part-whole metonymy that plays a large role in the extension of both meanings (via reanalysis) and forms (via analogy) to new contexts.

Metaphor capitalizes on perceived parallels between various domains that facilitate mapping relationships. The space-to-time mappings in (1b-c) and (6) are motivated by the inherent ambiguities between space and time that result from the fact that human beings are always moving through space and time simultaneously. This is particularly clear in the case of events like a conference. If I say *I saw my colleague at a conference*, I

am simultaneously referencing both the location and the time of the conference. However, I can also say *I saw my colleague in Paris*, and as long as I am not in Paris at the time of utterance, this will mean that I saw my colleague at the time when I was in Paris (for the conference). Similarly French *de* in (7) takes advantage of a possible ambiguity between a trajectory from a source and a part-whole relationship. In French, the preposition *de* 'from' can be used to mark the starting point of movement, as in *mon collègue est arrivé de Paris* 'my colleague has arrived from Paris'. This same preposition is also used in phrases like *prenez un morceau de la tarte qui est sur la table* 'take a piece from the pie that is on the table', where the trajectory is still accessible. The resulting *un morceau de la tarte* 'a piece of/from the pie' is more ambiguous, facilitating the leap to the entirely partitive *il y a de la tarte* 'there is some pie'. The inherent underdeterminacy of language leaves room for a multitude of ambiguities that abduction might take advantage of.

While metaphorical space-to-time mappings are perhaps most prevalent (Haspelmath 1997), many other relationships across domains can be perceived and thus provide grounds for ambiguity to facilitate morphological reanalysis. Some other examples of common metaphorical mappings include goal-to-purpose as in (8), and possession-to-obligation as in (9) (examples extracted from Heine and Kuteva 2002: 164–5 and 244).

(8) 'go' verb > purpose marker
Rama *bang* 'go' > *-bang*, subordinating conjunction of goal, purpose 'in order to'
Krio CE *gó* 'go' > purpose complementizer 'in order to'

(9) possessive > obligation marker
Latin *habēre* 'have' (+ infinitive) > obligation marker
Yoruba *ní* 'have' > obligation marker

For some examples of morphological reanalysis it can be hard to tell whether an ambiguity arises from a mapping within a single domain and therefore metonymy or across domains and therefore metaphor. It is not useful to draw a sharp line between metonymy and metaphor, and probably makes more sense to lump the two kinds of ambiguity together (Gossens 1990). An example of this is the common reanalysis of deontic modality as epistemic modality as in (10) (cf. Sweetser 1982): is this a metonymic mapping within the domain of modality, or is it a metaphoric mapping from the domain of modality to the domain of belief, or is it both at once, or does it even matter? Many examples are perhaps best described simply as cases of abstraction (also termed "desemantization" or "bleaching", cf. Section 1), as in (11), where the lexical meaning 'suffer' is abstracted to the grammatical concept of passive voice (examples extracted from Heine and Kuteva 2002: 284).

(10) deontic modality > epistemic modality
English *Tell John that he must arrive by noon. > I hear the doorbell. That must be John.*

(11) 'suffer' > passive voice
Vietnamese *bị* 'suffer' > passive marker

Korean *dangha-* 'suffer' > passive marker

The availability of a perceived ambiguity is merely an opportunity that a language (or language community) may or may not make use of. The presence of ambiguity makes reanalysis possible but does not predict reanalysis.

Exaptation

Another way for language to leave the door ajar for abduction is through the stranding of morphology when grammatical connections have become weakened or lost. For example, if a grammatical category has been or is in the process of being lost, the morphemes that expressed that category can either expire or instead be repurposed to express something (more or less) new. The term "exaptation" was coined by Stephen Jay Gould and Elisabeth Vrba in 1982 to describe the use of biological structures for new purposes, such as the use of respiratory and digestive structures by many animals for sound production, including speech in humans. Lass (1990, 1997) has borrowed the word exaptation to refer to the recycling of otherwise defunct morphology in language change.

An example of a lost category is the dual in most Slavic languages. Late Common Slavic (approximately 800-1000 CE) had a three-way grammatical number distinction, with singular vs. dual. vs. plural, although the dual number was less robust, with more syncretism and restricted use. The Slavic dual number survives today only in Slovene and Upper Sorbian. Other Slavic languages gradually shifted to a simpler singular vs. plural number system, but old dual nominal morphology persists here and there, usually exapted to signal a specialized plural. For example, until about the 14th century Old East Slavic had a Nominative/Accusative Dual inflectional marker *-a* for masculine nouns, mostly used with words referring to items that often come in pairs. Two of the most common nouns with referents that come in pairs are *bereg-á* 'riverbanks' and *bort-á* 'sides (of a ship)', share a similar stem structure (a liquid bounded by obstruents). By approximately the early 15th century, the Dual number was no longer relevant to the grammar and the Nominative/Accusative Dual marker *-a* was interpreted as expressing Nominative/Accusative Plural. This special Plural marker has expanded to other words with a similar stem structure like Russian *gorod-á* 'cities' and *golos-á* 'voices' as well as to names of professions like *professor-á* 'professors' and *direktor-á* 'directors'. Expansion continues in Modern Russian, and in recent decades has reached additional words, such as *sviter-á* 'sweaters'. We are here dealing with a morphological reanalysis coupled with analogy. Dual number was reanalyzed as Plural number, a process that was itself invisible, since the change was only in the meaning: the interpretation of *bereg-á* 'riverbanks' changed from [riverbank-NOM.DU] to [riverbank-NOM.PL] with no change of form. This change became manifest as a change in form when the inflectional marker *-á* with the meaning NOM.PL was extended to new contexts.

A similar but more complex opportunity for exaptation arises when an entire inflectional class is abandoned, leaving the morphemes of a whole paradigm "up for grabs". This scenario can likewise be illustrated with a page from the history of the Slavic languages, namely the history of the *ŭ*-stem masculine nominal paradigm which

was ousted by the *o*-stem nominal paradigm (for more details see Janda 1996a and b). By the time of Late Common Slavic, only six nouns (and possibly a handful of others), all of them masculine, remained in the *ŭ*-stem declension class. Sound changes had rendered the *ŭ*-stem paradigm syncretic with the *o*-stem paradigm in arguably the two most important exponents: the Nominative/Accusative Singular in *-ŭ* and the Accusative Plural in *-y*. At about the same time, the declension system was changing from one based on theme vowels to one based mainly on gender. All *ŭ*-stem nouns were ultimately absorbed into the *o*-stem paradigm which became the dominant masculine paradigm throughout the Slavic languages. This meant that the ten remaining *ŭ*-stem inflectional markers that were not syncretic with their *o*-stem equivalents became redundant, but they did not disappear. Nearly all *ŭ*-stem inflectional markers survive somewhere among the Slavic languages of today. In some modern languages we see the result of a paradigmatic morphological reanalysis where one or more old *ŭ*-stem markers have almost eclipsed the original *o*-stem equivalents, as is the case with the Genitive Plural *-ov* that is nearly universal for masculine hard stem nouns in Russian. In this instance, the morphological reanalysis is very subtle: the meaning of the Genitive Plural marker has changed from indexing a small declension class based on a theme vowel (*ŭ*) to indexing the entire masculine (hard stem) declension. Other changes involve a reanalysis where the set of referents is circumscribed and specialized, such as the extension of the *ŭ*-stem Nominative Plural to virile nouns in Polish, as in the honorific *profesor-owie* 'professors'. The change in meaning here involves a narrowing from simply male reference to specify male human beings of high status.

Once again analogy has made these morphological reanalyses visible. When the *ŭ*-stem and *o*-stem paradigms were merged, there were "extra" inflectional markers available for masculine nouns. For the Genitive Plural this was particularly fortunate since the *o*-stem marker for that paradigm cell had become identical with the Nominative Plural, creating an unfortunate syncretism that could be avoided by taking advantage of the distinctive *ŭ*-stem marker and spreading it to other masculine nouns. The specialization of Polish *-owie* to male human referents can be traced back to one of the six original *ŭ*-stem nouns, **synŭ* 'son', a high frequent noun that is often found in the Nominative Plural. Analogy then spreads this marker to other prominent virile referents. In both instances, analogy is facilitated by metonymic part-whole reasoning, where one or some words can be conceived of as part of a group that includes other referents that can therefore be eligible to use the same markers.

Again, opportunity does not determine an outcome. The fact that category and/or paradigm loss has left behind some morphology doesn't mean that any reanalysis or analogy will take place. Sometimes bits of morphology just get lost or persist as idiosyncratic leftovers that don't spread. Norwegian has lost grammatical case inflection on nouns, but some traces remain in idioms, like the formerly genitive *-s* in *gå til seng-s* 'go to bed' and the formerly dative *-e* in *dra av gård-e* 'depart' (originally 'depart from farm').

The remainder of this article delves more deeply into examples of morphological reanalysis that illustrate the range of the phenomenon along two dimensions

concerning the meaning and the status of the change. The meaning change may either be “on-track”, relatively expected, usually involving a shift within a category or following a typologically common trajectory, or alternatively the meaning change may be more unusual, “off-piste”. Morphological reanalysis may take place in a solitary context, involving a single form, or it may involve a larger set of items that converge to create a whole grammatical system. Neither of these distinctions are binary, and intermediate types exist. While exaptation can play a role across the range of meaning shifts, the unmooring of morphemes from their original roles can facilitate some of the most dramatic shifts in meaning, which we will return to in Section 6.

4. On-track meaning shift, solitary context: Typological patterns

Heine and Kuteva’s *World Lexicon of Grammaticalization* (2002) is an inventory of examples of morphological reanalysis observed across a sample of 528 languages. Most of their examples illustrate a meaning shift that can be expected (on-track) and that involves an isolated example from the perspective of the given language, but a typological regularity from a cross-linguistic perspective. Possible exceptions are the nine types in the inventory that yield classifiers which contribute to a convergent grammatical system; see Section 6. The goal of Heine and Kuteva’s inventory is to represent grammaticalization changes that are documented in multiple languages. The examples are cataloged as types defined by Source to Target shifts, such as Ablative > Partitive, that are attested in two or more languages of the sample. The inventory lists 395 Source > Target types. All examples cited in this section are extracted from Heine and Kuteva 2002 (which in turn cites more examples of each type, along with their primary sources), and here I follow their convention of using small caps for the names of Sources and Targets.

On the face of it, a claim that typologically common meaning shifts are semantically expected may seem circular: are they expected because they are common, or are they common because they are expected? It is logical that meaning shifts will usually take advantage of semantic proximity, meaning that they will also be more common, and it is perhaps impossible to measure semantic expectedness independently of frequency. However, closer inspection of the Source > Target types in Heine and Kuteva’s inventory shows a strong tendency for the meaning shifts illustrated in their examples to progress within the same or similar semantic fields. The analysis in this section is my own, based on the data in Heine and Kuteva 2002.

Space and time are the most common conceptual domains in Heine and Kuteva’s inventory, accounting for approximately 50% of both Sources and Targets. Examples of morphological reanalysis in (12) – (16) show how meanings shift within and between these related domains, further differentiated here as Location, Trajectory, Time, Phase, and State. In (12) a noun referring to a central location is reanalyzed as a locative suffix or preposition meaning ‘between’, which is also a central location with respect to two (or more) entities. Verbs meaning ‘arrive’ are reanalyzed as Allative prepositions in (13). Moving on to temporal concepts, in (14) we see adverbs denoting ‘afterward’ that are recruited as future tense markers. Parallels between space and time entail that events, like journeys, start and finish, and these phases are relevant in morphological

reanalysis. Examples in (15) show how verbs that express 'finish' are reanalyzed as Completive markers. Another space-to-time relationship motivates the reanalysis illustrated in (16), where stative verbs meaning 'sit' in space become Durative or Progressive aspect markers.

(12) Location: CENTER > BETWEEN (Heine and Kuteva 2002: 63)
Vai *tẹ* 'middle', 'midst', 'center', noun > *-tẹ* 'between', suffix
Albanian *midís* 'center', relational noun > 'between', Locative preposition

(13) Trajectory: ARRIVE > ALLATIVE (Heine and Kuteva 2002: 45)
Chinese *dào* 'reach, arrive', verb > *dào* 'to', preposition
Zande *dia* 'reach, arrive' > 'as far as, until', preposition

(14) Time: THEN > FUTURE (Heine and Kuteva 2002: 293–294)
Bari *(e)dé* 'then, afterward', adverb > *dé*, Future tense marker
Tok Pisin PE *baimbai* 'afterward, later' (< English *by-and-by*) > Future tense marker

(15) Phase: FINISH > COMPLETIVE (Heine and Kuteva 2002: 134–136)
Spanish *acabar (de)* 'finish, end, complete' > 'completely', auxiliary
Tok Pisin PE *pinis* 'finish' > Completive aspect marker

(16) State: SIT > CONTINUOUS (Heine and Kuteva 2002: 276–277)
Yolngu *nhina-* 'sit', stative verb > marker of Durative aspect
Korean *anc-* 'sit' > Progressive auxiliary

Other frequent conceptual domains represented in the Heine and Kuteva (2002) data can be described as Transfer, Quantification, Combination, and Reference, illustrated in examples (17) – (20). In (17) 'give' verbs that express transfer to a recipient are reanalyzed to become benefactive Dative prepositions. The quantifier 'all' is co-opted as a plural marker for pronouns in (18). In (19) Comitative prepositions used to show that two entities (usually people) are jointly engaged in an event are repurposed as conjunctions meaning 'and'. Reflexive suffixes indicating that the agent and patient of an event have the same referent are reanalyzed passive markers in (20), with valency reduced to refer only to the patient.

(17) Transfer: GIVE > DATIVE (Heine and Kuteva 2002: 153–154)
Mandarin Chinese *gei* 'give' > benefactive, Dative preposition
Ewe *ná* 'give', verb > 'for, to', benefactive, Dative preposition

(18) Quantification: ALL > PLURAL (Heine and Kuteva 2002: 36)
Colloquial southern American English *y'all*, Second person Plural pronoun
English *all* > Tok Pisin PE *ol* 'they', Third person Plural subject pronoun

(19) Combination: COMITATIVE > NP-AND (Heine and Kuteva 2002: 80–82)
Ewe *kplé* 'with', Comitative preposition > 'and', NP-coordinating conjunction
Turkish *ile* 'with', Comitative postposition > 'and', NP-conjoining conjunction

(20) Reference: REFLEXIVE > PASSIVE (Heine and Kuteva 2002: 253)
Russian *-sja* (*-s*' after vowels), Reflexive suffix > Passive marker
Danish *-s*, Reflexive suffix > Passive marker

The examples in (12) – (20) represent the trends in the majority of the data in Heine and Kuteva 2002, where meaning shifts tend to "stay in their lane" or make minimal shifts to closely related parallel semantic lanes. There are examples of reanalysis that might initially seem "off-piste", but are well motivated by parallels otherwise documented cross-linguistically. In (21), a Locative marker meaning 'on' is recruited for Comparative constructions. This semantic jump is actually short and well-established. Comparison is a scalar concept and scales are often conceived of vertically since adding more items onto a pile causes the top of the pile to move upward. This observation motivates the MORE IS UP metaphor, attested in many languages in expressions like English *high prices* and the *temperature is rising* (cf. Lakoff and Johnson 1980).

(21) UP > COMPARATIVE (Heine and Kuteva 2002: 305–306)
Naga *-ki* 'on', Locative suffix > 'than', marker of standard noun phrases in Comparative constructions
Ubykh *-n* 'on', Locative case suffix > 'than', marker of standard noun phrases in Comparative constructions

Heine and Kuteva (2002) have a single set of concepts that they use to define both Sources and Targets. Some concepts are used only by Sources, and these come in three groups that we can label as Actions (BEAT, DO, EAT, SAY, etc.), Body parts (BACK, BELLY, BODY, BOWELS, etc.), and Humans (CHILD, COMRADE, FATHER, MOTHER, etc.). The restriction of these concepts to Sources makes sense because these Source morphemes are all lexical (verb and noun stems) rather than grammatical, and therefore cannot serve as Targets (cf. our definition in (2) of morphological reanalysis). Concepts that appear only as Targets tend to be abstract grammatical designations for categories like Tense (DURATIVE, PERFECTIVE, PRESENT, etc.), Number (PLURAL, TRIAL, PAUCAL, etc.), and Reference (AGENT, AGREEMENT, PATIENT, etc.).

Given that forty-nine (34%) of the 143 grammatical concepts identified with Targets by Heine and Kuteva (2002) can also serve as Sources in their data, one might expect that it should be possible to find some fairly long grammaticalization chains as well as some that are bi-directional. In other words, it should be theoretically possible for morphological reanalysis to be recursive and unrestrained in direction. However, the grammaticalization chains actually attested are short and show strong directionality (See WBCDL026). The longest commonly attested grammaticalization chains combine only two steps of reanalysis, like example (1a-c) above, where a body part is reanalyzed as a marker of location or trajectory that is reanalyzed as a temporal marker. Based on the overlap between Source and Target concepts, it is theoretically possible to piece together only a few grammaticalization chains with three steps, and none of these are fully attested end-to-end in Heine and Kuteva (2002). The parts of one such hypothetical chain are illustrated in (22). The first step progresses within the category of deixis from

spatial location ‘here’ to deictic reference in a proximal location ‘this’. The second step is an abstraction to refer to an item as something conceptually available to the hearer by means of a Definite article. The third step is a semantic narrowing motivated by the fact that a Superlative picks out the single most extreme item on a scale, an item that is necessarily Definite.

(22) Hypothetical chain HERE > DEMONSTRATIVE > DEFINITE > SUPERLATIVE
HERE > DEMONSTRATIVE
Hausa *nân* ‘here’, adverb > ‘this’, proximal Demonstrative (Heine and Kuteva 2002: 172–173)
DEMONSTRATIVE > DEFINITE (Heine and Kuteva 2002: 109–110)
Hungarian *az/a* ‘this, that’, Demonstrative > ‘the’, Definite article
DEFINITE > SUPERLATIVE (Heine and Kuteva 2002: 106)
French “definiteness is the only means of distinguishing superlative from comparative predications”, as in *Marie est plus sage* ‘Marie is wiser’ vs. *Marie est la plus sage* ‘Marie is the wisest’

The only example of a bi-directional grammaticalization found in Heine and Kuteva (2002) is motivated by an association between two ways of expressing predicative possession in languages, namely with ‘be’ or ‘have’ verbs, illustrated in (23a-b). In Mandarin Chinese a verb meaning ‘exist’ has become a marker of possession, whereas the opposite has happened in French, where a verb meaning ‘have’ has become a maker of existence.

(23a) EXIST > H-POSSESSIVE (Heine and Kuteva 2002: 127–128)
Mandarin Chinese *yǒu* ‘exist’ > *yǒu*, verbal possession marker

tā	*yǒu*	*sān-*	*ge*	*háizi*
3.SG	exist	three	CL	child

‘S/He has three children’

(23b) h-POSSESSIVE > EXIST (Heine and Kuteva 2002: 241–242)
French *avoir* ‘to have’ > ‘exist’

Il	*y*	*a*	*deux*	*enfant-s*
it	there	has	two	child-PL

‘There are two children’

In sum, many examples of morphological reanalysis that are isolated phenomena from the perspective of a given language are robustly attested cross-linguistically, revealing patterns in how human beings connect lexical and grammatical concepts. The progress of morphological reanalysis in such cases involves meaning shifts either within a conceptual domain or between closely related conceptual domains. Approximately half of such shifts arise in expressions of space and time; other frequently encountered types involve concepts of transfer, quantification, combination, and reference. Morphological reanalysis is mostly finite and unidirectional: grammaticalization chains appear to be limited to only two steps, and only one bi-directional shift is attested.

5. On-track meaning shift, convergent context: Classifier systems
Classifiers are morphemes that form grammatical systems that interact with the lexicon. Classifier systems most often involve a minimal shift in meaning across a number of Source words that ultimately serve to both sort and unitize the referents of either nouns or verbs. I will present an example of a classifier system for both parts of speech.

Persian numeral classifiers
Linguistic descriptions of classifiers are most often of numeral classifiers that appear in a construction used to quantify nouns. Characteristic of languages with numeral classifiers is transnumerality of most nouns, meaning that in their bare form nouns do not specify singular or plural (cf. Bisang 1999: 114, Zhang 2013). For example, Persian *ketāb* means both 'book' and 'books'. Numeral classifiers serve as unitizers when the functions of count nouns are needed. Typical of numeral classifiers (especially sortal classifiers) is that the nouns they collocate with are grouped according to a more general parameter such as shape or animacy.

Persian has at least thirty classifiers (Mache 2012), three of which are illustrated in examples in (24a-c). All three examples portray a morphological reanalysis in which a noun has been reinterpreted as a classifier that appears in the *numeral* + *classifier* + *noun* construction, here illustrated with the numeral *se* 'three'. The classifier in (24a) is a grammaticalization of the word for 'sheet' and is used to quantify flat things like sheets of paper. In (24b) the word for 'ring' is used as a classifier with round things like tires. The word for 'person' is in (24c) a classifier used with words referring to people. In the examples of 'paper', 'tires', and 'workers' in (24a-c) the meanings of the classifiers overlap with the meanings of the nouns. A classifier can furthermore indicate modification of the item that is classified: in (24a) pills are unitized as sheets when they are in blister packs, and in (24b) tomato is unitized as rings when cut into that shape.

(24a) Persian *varaq* 'sheet' > classifier for flat things
se varaq kaqaz 'three sheets of paper'
se varaq qors 'three sheets of pills'

(24b) Persian *halqeh* 'ring' > classifier for round things
se halqeh lāstik 'three tires'
se halqeh gojeh 'three slices of tomato'

(24c) Persian *nafar* 'person' > classifier for people
se nafar kārgar 'three workers'

While the overall function of a numeral classifer system is to sort the nouns of a language into groups according to properties of the units they can refer to, this description of numeral classifiers is somewhat oversimplified. The nouns associated with a given classifier are not always easily grouped, classifiers can be polysemous, and the groups can overlap, meaning that a given noun might be associated with two or

more classifiers. It is often the case that there is a general classifier, like Persian *tā* that can be used as a default without any added semantic content beyond unitization.

A numeral classifier system such as that of Persian arises through the morphological reanalysis of a group of words (usually nouns) to share the same grammatical function as classifiers and appear in the same grammatical construction. The meaning shift is "on track" because the words that become classifiers do not undergo any extreme change in their meaning beyond semantic bleaching: in terms of their meanings, the resulting classifiers are more abstract versions of the nouns they develop from. In (24a-c) the abstract shape or humanness of the referents of the Source nouns is retained in the meaning of the Target classifiers. It is, however, possible for the meaning of a classifier to become polysemous through metonymic and metaphorical extensions. For example, the Thai classifier *tua* is prototypically used to refer to four-legged animals like buffalos and elephants. Iconic metaphorical mapping extends the use of this classifier to refer to other things with multiple limbs, such as tables, pants, and dolls. Metonymic extension carries this process further to include other items in some of these categories, such as other furniture and clothing (Deepadung 1997). While the grammaticalization of each word that becomes a classifier is probably a gradual and unique event and it is probably the case that different classifiers grammaticalize at different times, we can say that this is a convergent change since many items undergo a parallel morphological reanalysis that yields an entire system and a new grammatical construction.

Slavic verb classifiers

Classifier systems are known to exist for verbs as well. McGregor (2002) provides the first large-scale description of verb classifier systems based on data from Australian languages, and Dickey and Janda (2015) have argued that verbal classifiers exist also in Slavic languages. All Slavic languages distinguish Imperfective from Perfective verbs, and this distinction is usually overtly marked by the morphology. A typical pattern is that the "bare" (unprefixed) stem of a verb is Imperfective, while the addition of a prefix yields a Perfective verb. The Slavic verbal prefixes are derived historically from words that denote paths of movement, and the prefixes continue to express spatial trajectories when appended to motion verbs. The addition of a prefix to an Imperfective non-motion verb results in a Perfective verb, either a verb with the same meaning (when there is some overlap with the meaning of the prefix), or a verb with a somewhat modified meaning (when there is less or no overlap). Parallel to the unitizing function of numeral classifiers, the Slavic verb classifiers convert open-ended Imperfective activities and states into units of Perfective accomplishments and achievements. Furthermore, the abstract meanings of nearly all prefixes have developed polysemy.

Table 1 presents the classifier system for Russian verbs as an example of a Slavic verb classifier system. The seventeen prefixes that constitute this system are in the leftmost column. In the next column the prefixes are combined with the verb meaning 'walk' where we see that the spatial path meanings (glossed in small caps) are preserved. For example, the prefix *na-* in the third row of Table 1 has a spatial meaning of '(onto a) surface', which we see in the Perfective verb *na-jti* 'come upon, find' in the second column. The spatial meaning of this prefix overlaps with the meaning of the

Imperfective verb *pisat'* 'write' since writing is done on a surface. This combination yields the Imperfective – Perfective pair *pisat – na-pisat'*, both of which mean 'write' found in the fourth column. The meaning of the prefix has been extended to include ACCUMULATE on the logic that when things are put on a surface, a pile accumulates, and this meaning is illustrated with the Imperfective verb *grešit'* 'sin' and the specialized Perfective *na-grešit'* 'do a lot of sinning'.

The prewords that have become grammatical markers of perfectivity in Russian and other Slavic languages are an example of on-track convergent morphological reanalysis. The meaning is on-track because spatial meanings of the prewords are retained, serving as both concrete and abstract trajectories, as well as the basis for polysemy (see Janda et al. 2013 and Janda and Lyashevskaya 2013 for details). The context is convergent because an entire set of prefixes has emerged to mark a grammatical category (perfectivity) expressed in a specific construction (prefix-verb).

6. Off-piste meaning shift, solitary context: Exaptation
Exaptation in language can occur when one or more morphemes have been (or are in the process of being) left behind by a diachronic change. The leftover morphology is less firmly anchored to its prior meaning and can be reappropriated in ways that are more unusual, leading to off-piste meaning shifts. Exaptation occurs in special contexts that are usually solitary, though it can fit into a general drift in language change. I will present two examples, one of a Polish case + number marker that has taken on the role of a gender marker, and the other of a North Sámi Possessive marker that is arguably becoming a Vocative marker.

*Polish Dual > Virile numeral marker*s
Late Common Slavic had a three-way number distinction of Singular vs. Dual vs. Plural across all inflectional paradigms. The Dual was less robustly distinct than the other numbers: there was considerable syncretism among Dual forms, and it was used mostly with reference to paired items. By the late Middle Ages, the Dual was waning in most Slavic languages (see Section 3). Polish no longer has Dual number, but a Dual affix repurposed as a Virile marker for numerals persists. This story is summarized in Table 2 (cf. Grappin 1950, Janda 2000).

In the thirteenth century there was syncretism between Nominative and Accusative cases in the Dual number, which was potentially confusing particularly for Masculine nouns referring to humans who can easily appear as both subjects and objects of a clause. This ambiguity was alleviated for objects by using the Genitive Dual (analogous to the solution for a similar syncretism in the Singular, where the Genitive was also used to mark Animate objects), marked with the affix *-u*, for nouns with human referents, as well as the agreeing numeral and adjective. Over the next three centuries, the Genitive Plural replaced the Genitive Dual on the noun and adjective, and the Dual as a grammatical number disappeared from the language, leaving the *-u* affix on the numeral vulnerable for reinterpretation. This affix, reanalyzed as a Virile marker, spread to all numerals when used to count male humans, yielding a set of Virile numerals like *pięci-u* 'five', *dziesięci-u* 'ten' as opposed to ordinary numerals like *pięć* 'five', *dziesięć* 'ten'

used for all other referents. While this was a unique morphological reanalysis, it took place in the context of other changes in the history of Polish that resulted in Virile vs. Non-virile distinctions in the Nominative and Accusative Plural and on Past tense verb forms. Similar, though weaker, virility distinctions evolved also in nearby Czech, Slovak, and Ukrainian (cf. Janda 1999).

North Sámi Possessive > *Vocative*
In North Sámi possession can be indicated on a noun either by means of a Possessive suffix (NPx) that agrees in person and number with the possessor, or by means of a preposed Reflexive Genitive pronoun (ReflN) with the same agreement structure. Examples (25a-b) illustrate the two constructions with synonymous sentences cited from a novel (Vars 1986).

(25a) North Sámi NPx Possessive suffix construction

Kátjá…	*oll-ii*	*latnja-si-s*
Kátjá.NOM	reach-PST.3SG	room-ILL.SG-POSS.3SG

'Kátjá… got to her room'

(25b) North Sámi ReflN Reflexive Genitive construction

Kátjá…	*oll-ii*	*ieža-s*	*latnj-ii*
Kátjá.NOM	reach-PST.3SG	REFL.GEN-3SG	room-ILL.SG

'Kátjá… got to her room'

NPx is a more complex option, expanding the nominal paradigm from thirteen slots and ten unique forms to 130 slots and 91 unique forms entailing morphophonemic alternations, whereas ReflN has only nine forms. A century ago, NPx accounted for over 90% of possessive usage, but possibly due to pressure from language contact, NPx has been increasingly replaced by ReflN, and NPx now accounts for only about 40-20% of possessive usage (Antonsen and Janda 2015, Janda and Antonsen 2016). The one remaining stronghold of NPx is in the Nominative Singular of nouns with human (usually kinship) referents with a First person Singular possessor, as in (26). Such examples often collocate with Imperative verb forms, and the noun often has a Diminutive affix indicating endearment.

(26) North Sámi NPx > Vocative

Gula,	*máná-ž-an*
listen.IMP.2SG	child-DIM.NOM.SG-1SG.POSS

'Listen, my dear/little child.'

This use of the First person Singular NPx as a Vocative is productive with non-Sámi names of people and with anthropomorphized invocations of other referents such as *bussá* 'cat' and *násti* 'star' (Janda and Antonsen 2016, Antonsen and Janda 2020). While the reinterpretation in (26) entails a rather dramatic shift in meaning across grammatical categories, Possessive suffixes serve as "a kind of Vocative" in several other Uralic languages (Collinder 1960: 239–240 and Collinder 1965: 56), and a First person Singular Possessive construction has a Vocative function in Nanti (Michael 2013: 157).

The two reanalyses in this section are motivated by highly specific contexts that facilitate a leap from a waning grammatical category to a new one.

7. Conclusion

While morphological reanalysis is itself a largely invisible process, it interacts with other diachronic processes such as analogy and thus plays an essential role in spawning new grammatical categories and even entire new grammatical systems. And while robust typological trends show that morphological reanalysis tends to follow clear unidirectional paths, this process is to some extent open-ended, since one cannot rule out the possibility that an unusual ambiguity might open the way for an unusual shift of meaning.

Related Articles (See Also)

[Please use the table below to provide a list of related articles]

Article ID
WBCDL016
WBCDL017
WBCDL019
WBCDL023
WBCDL025
WBCDL026
WBCDL031 WBCDL081
WBCDL089

References

Andersen, Henning. 1973. “Abductive and deductive change.” *Language*, 49: 765–793.

Antonsen, Lene, and Laura A. Janda. 2015. “Oamastanráhkadusat davvisámi girjjálašvuođas [Possessive constructions in North Saami prose].” *Dieđut* 2: 9–43.

Antonsen, Lene, and Laura A. Janda. 2020. “Davvisámi earutkeahtes oamasteapmi [Inalienable possession in North Saami].” *Sámi dieđalaš áigečála*, 1: 61–87. https://site.uit.no/aigecala/files/2021/02/SDA-2020-antonsen-ja-janda.pdf

Bisang, Walter. 1999. “Classifiers in east and southeast Asian languages: counting and beyond.” In *Numeral Types and Changes Worldwide*, edited by Jadranka Gvozdanović, 113–185. Berlin: Mouton De Gruyter.

Bybee, Joan. 2015. *Language Change*. Cambridge: Cambridge University Press.

Collinder, Björn. 1960. *Comparative Grammar of the Uralic Languages*. Uppsala: Almqvist & Wiksells.

Collinder, Björn. 1965. *An Introduction to the Uralic Languages.* Berkeley and Los Angeles: University of California Press.

Deepadung, Sujaritlak. 1997. “Extension in the usage of the Thai classifier /tua/.” In *Southeast Asian Linguistic Studies in Honour of Vichin Panupong*, edited by Arthur S. Abramson, 49–56. Bangkok: Chulalongkorn University Press.

Dickey, Stephen M. and Laura A. Janda. 2015. “Slavic aspectual prefixes and numeral classifiers: Two kinds of lexico-grammatical unitizers” *Lingua*, 168, 57–84.

Goossens, Louis. 1990. “Metaphtonymy: the interaction of metaphor and metonymy in expressions for linguistic action.” *Cognitive Linguistics*, 1: 323–340.

Grappin, Henri. 1950. *Les Noms de Nombre en Polonais.* Kraków: Polska akademia umiejętności.

Haspelmath, Martin. 1997. *From Space to Time. Temporal Adverbials in the World's Languages* (= LINCOM Studies in Theoretical Linguistics 03). München–Newcastle: LINCOM EUROPA.
https://www.eva.mpg.de/fileadmin/content_files/staff/haspelmt/pdf/SpaceTime.pdf

Heine, Bernd and Tania Kuteva. 2002. *World Lexicon of Gramaticalization.* Cambridge: Cambridge University Press.

Hopper, Paul J. and Elizabeth C. Traugott. 2003. *Grammaticalization*. Cambridge: Cambridge University Press.

Janda, Laura A. 1996a. *Back from the brink: a study of how relic forms in languages serve as source material for analogical extension* (= LINCOM Studies in Slavic Linguistics 01). Munich and Newcastle: LINCOM EUROPA.

Janda, Laura A. 1996b. “Figure, ground, and animacy in Slavic declension.” *Slavic and East European Journal*, 40: 325–355.

Janda, Laura A. 1999. “Whence virility? The rise of a new gender distinction in the history of Slavic.” In *Slavic gender linguistics*, edited by Margaret H. Mills, 201–228. Amsterdam and Philadelphia: John Benjamins.

Janda, Laura A. 2000. “From Number to Gender, from Dual to Virile: Bridging Cognitive Categories.” In *Between Grammar and Lexicon*, edited by Ellen Contini-morava and Yishai Tobin, 73–86.

Janda, Laura A. To Appear a. “Gender and Animacy”. In *The Oxford Guide to the Slavonic Languages*, edited by Jan Fellerer and Neil Bermel. Oxford: Oxford University Press. 17pp.

Janda, Laura A. To Appear b. “Polysemy of affixes: A Slavic Perspective.” In *Wiley Blackwell Companion to Morphology*, edited by Antonio Fábregas. 26pp.

Janda, Laura A., and Lene Antonsen. 2016. “The ongoing eclipse of possessive suffixes in North Saami: A case study in reduction of morphological complexity.” *Diachronica*, 33: 330–366. DOI: http://dx.doi.org/10.1075/dia.33.3.02jan

Janda, Laura A., Anna Endresen, Julia Kuznetsova, Olga Lyashevskaya, Anastasia Makarova, Tore Nesset, Svetlana Sokolova. 2013. *Why Russian aspectual prefixes aren’t empty: prefixes as verb classifiers*. Bloomington, IN: Slavica Publishers.

Janda, Laura A. and Olga Lyashevskaya. 2013. “Semantic Profiles of Five Russian Prefixes: *po-*, *s-*, *za-*, *na-*, *pro-*.” *Journal of Slavic Linguistics*, 21, 211–258.

Lass, Roger. 1990. “How to Do Things with Junk: Exaptation in Language Evolution.” *Journal of Linguistics*, 26: 79–102.

Lass, Roger. 1997. Historical Linguistics and Language Change (= Cambridge studies in linguistics 81). Cambridge: Cambridge University Press.

Mache, Avazeh. 2012. *Numeral classifiers in Persian* (= LINCOM studies in language typology 22). Munich: LINCOM EUROPA.

McGregor, William B. 2002. *Verb Classification in Australian Languages* (= Empirical Approaches to Language Typology 25). Berlin: Mouton de Gruyter.

Michael, Lev. 2013. “Possession in Nanti.” In *Possession and Ownership*, edited by Alexandra Y. Aikhenvald and R. M. W. Dixon, 149–166. Oxford: Oxford University Press.

Peirce, Charles S. 1903. “Harvard lectures on pragmatism.” *Collected Papers* 5, paragraphs 180–212.

Sweetser, Eve. 1982. “Root and Epistemic Modals: Causality in Two Worlds.” *Proceedings of the Annual Meeting of the Berkeley Linguistics Society*, 8: 484–507.

Vars, Elle Márjá. 1986. *Kátjá*. Karasjok: ČálliidLágádus.

Ylikoski, Jussi. 2016. “Degrammaticalization in North Saami: Development of adpositions, adverbs and a free lexical noun from inflectional and derivational suffixes.” *Finnisch-Ugrische Mitteilungen*, 40: 113–173.

Zhang, Niina Ning. 2013. *Classifier Structures in Mandarin Chinese*. Berlin: Mouton de Gruyter.

Figure captions

[Please insert any figure captions here]

Tables

Prefix	Prototypical spatial meaning with example of *-jti* 'walk'	Other meanings related to the prototypical spatial meaning	Example to illustrate an overlapping meaning	Example to illustrate a specialized meaning
do-	REACH THE END *do-jti* 'reach a place on foot'	EXCESS, ADD	--	*lit'* 'pour' > ADD > *do-lit'* 'add by pouring'
iz-	OUT OF A CONTAINER *izo-jti* 'emanate from'	EMPTY A CONTAINER, EXHAUSTIVE RESULT, EXHAUST A SURFACE, NEGATIVE EXHAUSTION, MAKE OUT OF, DECLINE/DEVIATE, ACQUIRE	*pačkat'* 'stain' > EXHAUST A SURFACE *is-pačkat'* 'stain'	*pisat'* 'write' > EXHAUST A SURFACE > *is-pisat'* 'fill up with writing'
na-	SURFACE *na-jti* 'come upon, find'	ACCUMULATE	*pisat'* 'write' > SURFACE > *na-pisat'* 'write'	*grešit'* 'sin' > ACCUMULATE > *na-grešit'* 'do a lot of sinning'
o(b)-	AROUND *obo-jti* 'walk around, avoid'	PASS, OVERDO, MISTAKE, AFFECT MANY, AFFECT A SURFACE, ENVELOP, IMPOSE/ACQUIRE A NEW FEATURE	*ledenet'* 'freeze to ice' > AFFECT A SURFACE > *ob-ledenet'* 'freeze ice'	*vešat'* 'hang' > AFFECT A SURFACE > *ob-vešat'* 'cover by hanging'
ot-	DEPART *oto-jti* 'walk away from'	BOUNCE, UNSTICK, REMOVE, MAKE NON-FUNCTIONAL, STOP AT THE ENDPOINT	*reagirovat'* 'react' > BOUNCE > *ot-reagirovat'* 'react'	*lete-t'* 'fly' > BOUNCE > *ot-letet'* 'bounce back'
pere-	TRANSFER *pere-jti* 'walk across'	SUPERIORITY, OVERDO, REDO, DURATION/OVERCOME, BRIDGE, TURN OVER, MIX, DIVIDE, SERIATIM, THOROUGH	*putat'* 'mix' > MIX > *pere-putat'* 'mix'	*kričat'* 'shout' > SUPERIORITY > *pere-kričat'* 'outshout'
po-	SET OUT *po-j-ti* 'set out on foot'	RESULT, SOME, DISTRIBUTE	*glupet'* 'become stupid' > RESULT > *po-glupet'* 'become stupid'	*čitat'* 'read' > SOME > *po-čitat'* 'read for a while'
pod-	APPLY TO BOTTOM *podo-jti* 'walk up to'	HORIZONTAL APPROACH, ADJUST, INCREMENT, SECRETLY, MINIMAL	*itožit'* 'sum up' > APPLY TO BOTTOM	*delat'* 'do' > SECRETLY > *pod-delat'* 'forge'

			> *pod-itožit'* 'sum up'	
pri-	ARRIVE *pri-jti* 'arrive on foot'	ATTACH, ADD, ATTENUATE	*blizit'sja* 'approach' > ARRIVE > *pri-blizit'sja* 'approach'	*šit'* 'sew' > ATTACH > *pri-šit'* 'sew on'
pro-	THROUGH *pro-jti* 'walk through'	THOROUGH, DURATION, DISTANCE, PASS	*čitat'* 'read' > THOROUGH > *pro-čitat'* 'read'	*plakat'* 'weep' > DURATION > *pro-plakat'* 'weep all through a period of time'
raz-	APART *razo-jtis'* 'walk away in different directions'	CRUSH, SPREAD, SWELL, DISSOLVE, EXCITEMENT, UN-	*kolot'* 'chop up' > APART > *ras-kolot'* 'chop up'	*gruzit'* 'load' > UN- > *raz-gruzit'* 'unload'
s-	DOWN *so-jti* 'walk down'	TOGETHER, ONCE	*šit'* 'sew' > TOGETHER > *s-šit'* 'sew'	*glupit'* 'act stupid' > ONCE > *s-glupit'* 'do one stupid thing'
u-	MOVE AWAY *u-jti* 'leave on foot'	MOVE DOWNWARDS, CONTROL, REDUCE, HARM, PERCEIVE, PLACE/FIT, KEEP/SAVE, COVER COMPLETELY, DEPART FROM NORM	*krast'* 'steal' > MOVE AWAY > *u-krast'* 'steal'	*govorit'* 'speak' > CONTROL > *u-govorit'* 'persuade'
v-	INTO *vo-jti* 'enter'		*putat'sja* 'get mixed up in' > INTO > *v-putat'sja* 'get mixed up in'	
v(o)z-	MOVE UPWARD *vzo-jti* 'ascend'	AGITATE, RESIST, REBUILD	*trevožit'* 'disturb' > AGITATE > *vs-trevožit'* 'disturb'	*razit'* 'strike' > RESIST > *voz-razit'* 'object to'
vy-	OUT OF A CONTAINER *vy-jti* 'exit'	EMPTY A CONTAINER, EXHAUSTIVE RESULT, EXHAUST A SURFACE, NEGATIVE EXHAUSTION, CREATE AN IMAGE ON A SURFACE, MAKE OUT OF, DECLINE/DEVIATE, ACQUIRE, ENDURE	*polot'* 'pull out weeds' > OUT OF A CONTAINER > *vy-polot'* 'pull out weeds'	*stoja-t'* 'stand' > ENDURE > *vy-stojat'* 'hold out'
za-	DEFLECT *za-jti* 'stop by on one's way'	EXCESS, BEGIN, EXCHANGE, ATTACHMENT, COVER,	*asfal'tirovat'* 'pave with asphalt' > COVER > *za-asfal'tirovat'*	*govorit'* 'speak' > BEGIN > *za-govorit'* 'begin to speak'

		FILL, CHANGE TO A FIXED STATE	'pave with asphalt'	

Table 1: Russian prefixes with their spatial meanings and other related meanings, creating three kinds of Perfective verbs: motion verbs that show the spatial meaning of the prefix, other verbs with meanings that overlap with the prefix, and Perfective verbs with modified meanings. This Table is adapted and expanded from a similar table in Janda To Appear b.

miał dw-a młod-a syn-y [had two-ACC.DU young-ACC.DU son-ACC.DU]	ACC.DU throughout; ACC.DU and NOM.DU are identical	13th C
miał dw-u młod-u syn-u [had two-GEN.DU young-GEN.DU son-GEN.DU]	GEN.DU throughout Virile nouns only	14th C
miał dw-u młod-ych syn-u [had two-GEN.DU young-GEN.PL son-GEN.DU]	adjective GEN.PL	15th C
*miał dw-**u** młod-ych syn-ów* [had two-VIRILE young-GENACC.PL son-GENACC.PL]	adjective and noun GENACC.PL, spreads to all Virile Accusative	16th C

Table 2: Evolution of the phrase meaning '(he) had two sons' from Old to Modern Polish, showing the gradual shift from Accusative to Genitive inflections, leaving behind an *-u* affix available for exaptation as a Virile marker on the numeral