Cycles and continua

Cycles and continua: On unidirectionality and gradualness in language change

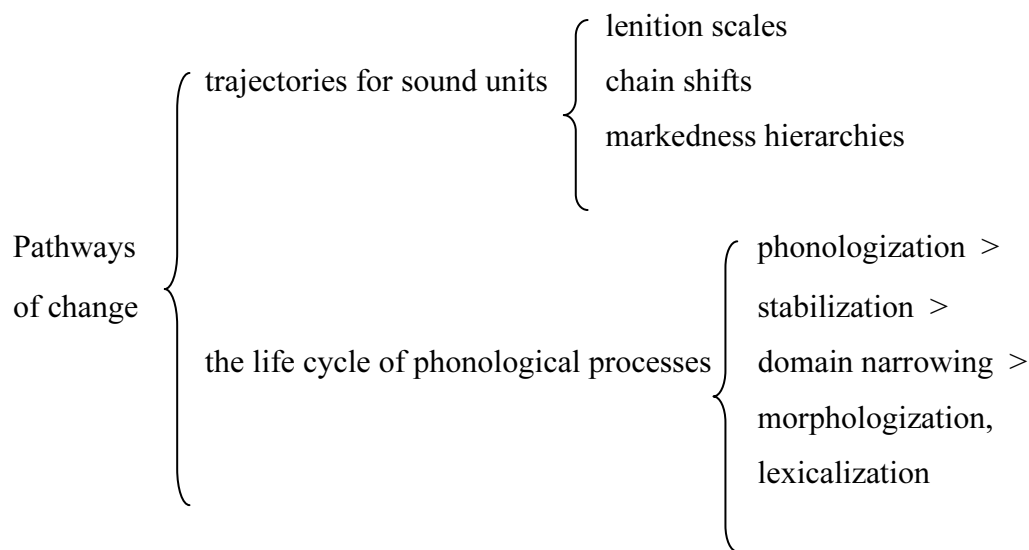Ricardo Bermúdez-Otero and Graeme Trousdale

1. Introduction

Since the nineteenth century, linguists have discerned large-scale trajectories of change in the history of English: e.g. the Great Vowel Shift (Luick 1896), the ME length adjustment (Luick 1898), the negation cycle (Jespersen 1917). Several of these trajectories have turned out to instantiate crosslinguistically recurrent diachronic pathways such as grammaticalization clines. Advances in our understanding of these diachronic pathways can therefore stimulate the rethinking of whole aspects of the history of English in ways to which standard period-based accounts (e.g. Hogg 1992–2001) may not readily lend themselves. The chapters in this Section all seek to explore this possibility.

In this lead chapter we set the scene with a survey of recurrent pathways of change. We draw parallels between directional change in phonology and in morphosyntax, paying particular attention to the similarities between the life cycle of phonological processes (Bermúdez-Otero 2007: 503–4) and grammaticalization. Throughout the discussion, we focus on the difficult questions raised by diachronic gradualness and synchronic gradience (Traugott and Trousdale 2010).

2. The life cycle of phonological processes

In phonological change one may initially distinguish between two types of diachronic trajectory according to whether one focuses on the long-term historical evolution of sound units (e.g. segments) or of sound patterns (e.g. alternations):
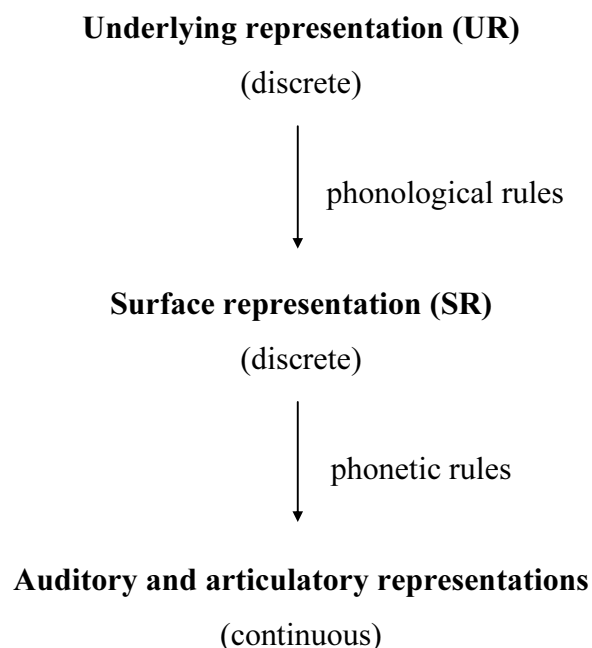
(1)

trajectories for sound units
- lenition scales
- chain shifts
- markedness hierarchies

Pathways of change

the life cycle of phonological processes
- phonologization >
- stabilization >
- domain narrowing >
- morphologization, lexicalization

Several chapters in this Section address diachronic trajectories for sound units in the history of English: Honeybone deals with lenition in general, and Hay and Clendon address derhoticization in particular; Dinkin discusses chain shifts; and Sharma and Wiltshire explore the role of markedness hierarchies in the phonological development of New Englishes. Anticipating one of the themes of this chapter, we may note that lenition provides a suggestive phonological counterpart for the processes of erosion and loss at work in "syntactic cycles" in the sense of van Gelderen (2009: 2); see section 3.3 and Wallage (this volume).

In this lead chapter, however, we shall be predominantly concerned with the direction of change in the long-term evolution of phonological and morphosyntactic processes. Most linguistic sound patterns first arise through events of "phonologization" (Hyman 1976), whereby an articulatory, acoustic, or auditory phenomenon beyond human cognitive control gives birth to a new language-specific pattern of gradient phonetic implementation (see section 2.1). As they evolve, however, these new phonetic patterns tend to become increasingly detached from their grounding in the physics and physiology of speech. First, sensitivity to continuous phonetic dimensions is replaced by reference to discrete phonological features. Bermúdez-Otero (2007: 504–6) calls this "stabilization" (section 2.1). Later, categorical phonological rules, which initially apply across the board, acquire morphosyntactic conditions, notably through the narrowing of their "cyclic domains" (Bermúdez-Otero 2006: 504, 2011: 2024–25), and may go on to develop lexical exceptions (section 2.2). Eventually, phonological rules may become altogether "morphologized"

(Anderson 1988: 329ff.) or "lexicalized" (section 2.2). This diachronic pathway has come to be known as "the life cycle of phonological processes" (Bermúdez-Otero 2007: 503–4, 2011: 2024–25, and references therein). It is largely unidirectional, and it bridges the whole span between the realm of physical law (acoustics) and the realm of the arbitrariness of the sign (the lexicon):

(2)   physics   morphology
                    >   phonetics   >   phonology   >
         physiology   lexicon

         Seen in this way, the life cycle of phonological processes bears a striking resemblance to paths of grammaticalization (cf. Givón 1979: 209):

(3)   discourse   >   syntax   >   morphology …

The resemblance is far from trivial. Both in grammaticalization and in the life cycle of phonological processes one is faced with the question of what to make of apparent exceptions to unidirectionality (sections 2.4, 3.4). Similarly, a common event in the life cycle of sound patterns is "rule scattering", whereby the stabilization of a gradient phonetic process introduces a new categorical rule into the phonology whilst its gradient forerunner remains *in situ* in the phonetics (Bermúdez-Otero 2007: 506; section 2.5 below). The effects of rule scattering are thus similar to those of "layering" (Hopper 1991: 22) in grammaticalization, as exemplified by the synchronic coexistence in PDE of motion *be going to* with future *be going to* (section 3.5).

2.1 Phonologization and stabilization: External /n#k/ sandhi in PDE
Grammatical architectures in the structuralist and generativist tradition postulate a modular separation of phonology and phonetics (Bermúdez-Otero 2007: 501ff.):

(4)

Underlying representation (UR)

(discrete)

|
| phonological rules
↓

Surface representation (SR)

(discrete)

|
| phonetic rules
↓

Auditory and articulatory representations

(continuous)

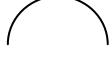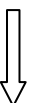In a grammar set up in accordance with this classical architecture, innovations in different modules manifest themselves as different types of historical changes (Kiparsky 1988; Bermúdez-Otero 2007: 503). Notably, innovations in the phonetic implementation component produce "neogrammarian sound changes" (see Labov (2010: Chapter 13) for examples from present-day American English). Such changes are phonetically gradual but lexically regular, and, whilst they may display exquisite sensitivity to prosody, they do not directly refer to morphosyntactic structure (but see section 2.5 below). In this chapter we use the term "phonologization" specifically to refer to neogrammarian sound changes taking place when a physical or physiological phenomenon impinging on speech gives rise to a new phonetic rule. In phonologization, therefore, a mechanism beyond human cognitive control (and, in that sense, extragrammatical) somehow causally contributes to the emergence of a new language-specific (and cognitively controlled and grammar-internal) generalization over continuous phonetic dimensions.

There is a widespread consensus that this causal relationship is mediated by speech perception. Notably, Ohala (1981) has famously proposed that phonologization occurs when a property of the speech signal created by a mechanical effect is misinterpreted by the listener as being controlled by the speaker's grammar. However, Ohala rejects the modular separation of phonetics and phonology, and so his own implementation of the idea fails to account for the lexical regularity of neogrammarian sound change. This problem does not arise in perception-driven models of phonologization that preserve modularity. Drawing upon

Boersma's (2009) modular architecture, for example, Hamann (2009) suggests that phonologization affects the grammatical constraints, called "cue constraints", that regulate the mapping between phonological categories in surface representations and the values of continuous auditory parameters in auditory representations. Thus, in Hamann's model, neogrammarian sound change involves the reweighting of perceptual cues across generations. As well as explaining the regularity of neogrammarian change, this proposal has the advantage of predicting the "structure-preserving bias" in phonologization, whereby a mechanical effect upon a phonetic dimension (e.g. duration, F_0) has a greater chance of becoming phonologized in a language that already uses the same phonetic dimension for cueing a phonological category (e.g. length, tone) (see Bermúdez-Otero and Hogg 2003: 98). In Boersma and Hamann's model, this bias emerges because, in such a language, the cue constraints forbidding the association of particular values of the phonetic attribute with the phonological category are already ranked low.

The classical modular architecture (4) entails a distinction between "phonologization" as defined above and "stabilization", which designates the diachronic process whereby a gradient phonetic rule is reinterpreted as a generalization over discrete categories in the phonological surface representation. This difference emerges clearly in the findings of Ellis and Hardcastle's (2002) articulatory study of external /n#k/ sandhi (as in *ban cuts*) in several idiolects of PDE. Ellis and Hardcastle's data enable us to reconstruct the historical evolution of a process of reduction of the tongue-tip gesture for the underlying /n/, presumably grounded in the relatively poor acoustic cueing of nasal place in preconsonantal position. Different idiolects show this process caught at three successive stages in its life cycle: before the onset of reduction (5b), after phonologization (5c), and after stabilization (5d). The most conservative speakers consistently attain midsagittal linguoalveolar closure in the realization of the nasal (5b). Relatively innovative speakers produce residual coronal gestures in which the tongue tip rises without achieving midsagittal contact. These speakers have acquired a gradient phonetic rule of gestural reduction (5c), arising from the phonologization of the acoustic effects mentioned above. A third set of even more advanced speakers produce tokens of *ban cuts* without any tongue-tip raising at all for the nasal. Those individuals for whom this is the only articulatory realization might conceivably be analysed as having the gradient process of gestural reduction in (5c) applying at ceiling level. However, Ellis and Hardcastle identified a subset of speakers who displayed variation between two discrete choices: full midsagittal linguoalveolar closure as in (5b), or complete absence of tongue-tip raising. This bimodal pattern cannot be described by means of a continuous process of gestural reduction.

Rather, it reflects the variable but categorical application of a rule of autosegmental delinking and spreading in the phonology (5d). This categorical rule is the stabilized counterpart of the gradient process of gesture reduction in (5c).

(5)   UR   SR   Gestural score

   a. *ba**ng** comes*   ŋ   k   ŋ   k   TT
       (control condition) | | | |
                                     Dor Dor   Dor Dor   TD

   b. *ba**n** cuts*   n   k   n   k   TT
       no reduction | | | |
                                     Cor Dor   Cor Dor   TD

            ⇓ *phonologization*

   c. *ba**n** cuts*   n   k   n   k   TT
       gradient gestural reduction | | | |
                                     Cor Dor   Cor Dor   TD

            ⇓ *stabilization*

   d. *ba**n** cuts*   n   k   ŋ   k   TT
       categorical feature delinking | | |
                                     Cor Dor   Dor   TD

                                                  TT = tongue tip
                                                  TD = tongue dorsum

Interestingly, Ellis and Hardcastle (2002: 394) refrained from drawing the conclusion that we reach here, pointing out that, in some individuals, tokens of underlying /n/ realized with no tongue-tip raising remained phonetically different from realizations of underlying /ŋ/ in the same environment. More specifically, the former had significantly shorter durations. However, this observation is compatible with – and indeed corroborates – the categorical

autosegmental analysis. First, the output of delinking and spreading is a place-linked structure, as shown in the SR for (5d), which remains different from the fake geminate in the control condition (5a). Secondly, the durational difference points in the right direction: the bigestural structure (5a) has greater duration than the monogestural one (5d). Indeed, Holst and Nolan (1995: 32) found very strong durational compression in instances of categorical /s#ʃ/→[ʃ·] sandhi.

Determining whether or not a sound pattern has become categorical normally requires careful statistical analysis of high-quality phonetic data from individual speakers. Indeed, in cases that may involve hidden residual gestures, nothing short of ultrasound or electromagnetic articulography will do. This becomes apparent not only in Ellis and Hardcastle's (2002) investigation of /n#k/ sandhi, but also in Lawson, Stuart-Smith, and Scobbie's (2008) study of ongoing derhoticization in Glasgow. Bimodal distributions of the sort found in speakers who vary between (5b) and (5d) but avoid (5c) provide good evidence that stabilization has indeed taken place, but the converse is not true: absence of bimodality does not entail absence of categoricity, since a mixture of two densities creates a bimodal distribution only under certain conditions. The problem is further compounded by the fact that stabilization often results in "rule scattering": a new categorical rule enters the phonology, but a version of the old gradient process remains active in the phonetic implementation module (see section 2.5). Despite its limitations, however, the bimodality criterion yields important conclusions. For example, it enables one to settle the long-running debate whether American English /t,d/-flapping is a categorical rule of the phrase-level phonology or a phonetic process gradiently shortening the hold phase of alveolar plosives. In a recent acoustic study by Herd, Jongman, and Sereno (2010: 508), the variable application of flapping was found to give rise to a clearly bimodal distribution on the duration continuum, with each speaker's plosive and flapped allophones forming distinct – and indeed nonoverlapping – token clusters. This confirms that the flapping rule has indeed reached the stabilization stage in its life cycle. As we saw in the case of /n#k/ sandhi, this conclusion is perfectly compatible with the observation that contrasts such as *utter* vs *udder* are incompletely neutralized.

While it is thus often feasible to decide whether or not a sound pattern has become categorical, the causes of stabilization are far less well understood. Boersma (forthcoming: section 10.2.7) reviews a range of possible approaches to the emergence of categories in the surface phonological representation. These include models of the "perceptual magnet effect"

in which a nonuniform distribution of tokens in acoustic space induces a corresponding warping of perceptual space, with the emergence of "attractors". Boersma observes that, at present, all these models have difficulty explaining how category labels become available to symbolic computation in the phonology.

2.2 The narrowing of cyclic domains: James Elphinston's /ŋg/

After a sound pattern has become stabilized as a generalization over discrete categories in the surface phonological representation, it can go on to develop sensitivity to morphosyntactic structure (as opposed to purely prosodic conditioning). In traditional historical linguistics, the relevant changes fall under the rubric of "analogy". In a large proportion of cases, "analogy" has the effect of progressively narrowing down the morphosyntactic domain over which a phonological process applies. Concomitantly, the process ceases to be surface-true and becomes increasingly opaque. The history of Late Modern English (LModE) provides several examples. A particularly clear one was highlighted by Garrett and Blevins (2009: 528), and subsequently taken up by Bermúdez-Otero (2006: 504, 2011: 2024–25). It concerns the diachronic evolution of the rule of postnasal /g/-deletion found in varieties such as RP.

In its purely phonological aspect, the generalization is that [g] cannot occur in the coda if immediately preceded by [ŋ]. Accordingly, any token of underlying /ŋg/ is expected to surface faithfully in environments where an onset position is available to the plosive; otherwise, deletion will apply. The testimony of the orthoepist James Elphinston reveals that in the eighteenth century there were dialects where this generalization held true across the board. In particular, word-final /ŋg/ clusters were able to escape /g/-deletion through the syllabification of the plosive in the onset before a vowel or liquid in the following word.

(6)   sin[g] aloud   sprin[g] eternal

        prolon[g] it   lon[g] repose

        stron[g] and mighty   youn[g] Leander

As noted by Garrett and Blevins (2009: 528), Elphinston's report indicates that the conditions that favoured resyllabification included absence of a strong phrase boundary ("immediate connexion and dependance") and absence of stress on the following syllable ("feebleness").

Crucially, however, Elphinston describes the rescue of postnasal /g/ through phrase-level resyllabification (6) as limited to the speech used "upon solemn occasions", i.e. to formal registers. Before a vowel or liquid in the same word (7), in contrast, the plosive was systematically retained even in informal speech.

(7)   han[g]-er   han[g]-ing

        sin[g]-er   sin[g]-ing
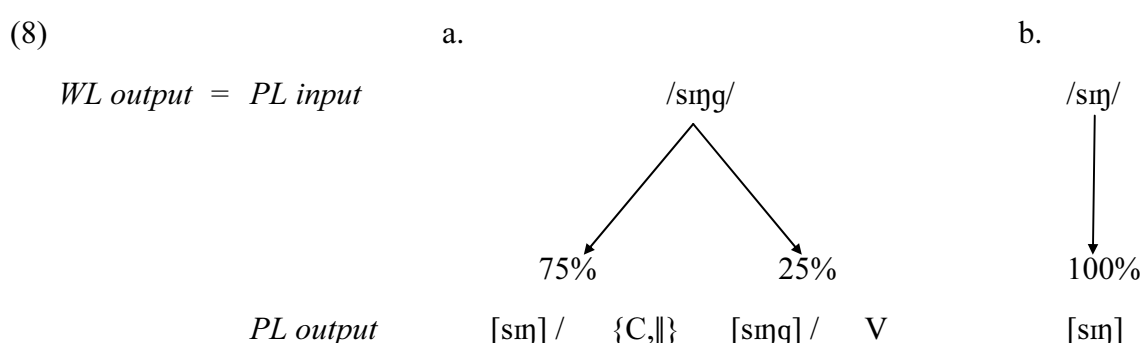
                      prolon[g]-ing

The orderly variation displayed by Elphinston's dialect reflects phonological change in progress. His formal register is diachronically conservative. His informal register, in contrast, has taken a step towards present-day RP, applying postnasal deletion to word-final /g/ regardless of context.

In stratal-cyclic architectures such as those of Lexical Phonology or Stratal Optimality Theory, the change in progress in Elphinston's dialect would be described as narrowing down the morphosyntactic domain of application of /g/-deletion, which concomitantly climbs up from a lower stratum (the phrase level) to a higher stratum (the word level). Before the change, postnasal /g/-deletion applies over phrase-level domains, and so is sensitive to the effect of the phrasal context upon the syllabification of word-final /g/. On completion of the change, the application of /g/-deletion becomes confined to the grammatical word: information about the phrasal context ceases to be available, word-final /g/ is treated as a coda even when followed by a vowel in the next word, and consequently /g/-deletion becomes opaque on the surface (it "overapplies").

Table 1. Narrowing of the morphosyntactic domain of postnasal /g/-deletion in James Elphinston's dialect

	phrase-level /g/-deletion (conservative)	word-level /g/-deletion (innovative)
⟦PL ⟦WL sin/**g**/-er⟧⟧	[g]	[g]
⟦PL ⟦WL sin/**g**/⟧⟦WL aloud⟧⟧	[g]	[Ø]
⟦PL ⟦WL sin/**g**/⟧⟧	[Ø]	[Ø]

This transition from phrase-level to word-level application was probably driven by input restructuring (Bermúdez-Otero 2011: 2024). In the conservative grammar (8a), the word *sing* was represented as /sɪŋg/ in the input to the phrase-level phonology. Surface tokens lacking [g] in preconsonantal and prepausal environments were derived by means of an unfaithful phrase-level mapping. Such tokens, however, occurred approximately three times more frequently than faithful prevocalic ones (Bybee 1998: 73). Learners who took them at face value replaced /sɪŋg/ with /sɪŋ/ in the phrase-level input (8b). The eventual effect was to impose a phonotactic ban on coda [g] after [ŋ] in the word-level output, and so the rule of postnasal /g/-deletion climbed up from the phrase to the word level.

(8)   a.   b.

WL output = PL input   /sɪŋg/   /sɪŋ/

         75%   25%   100%

PL output   [sɪŋ] / __ {C,‖}   [sɪŋg] / __ V   [sɪŋ]

Later, the entire development repeated itself in the input to the word level (i.e. the output of the stem level), replacing Elphinston's *si*[ŋg]-*er* and *si*[ŋg]-*ing* (7) with present-day *si*[ŋ]-*er* and *si*[ŋ]-*ing*. Significantly, current patterns of inter- and intra-dialectal variation in /l/-

darkening suggest an identical diachronic trajectory consisting of successive rounds of domain narrowing (Bermúdez-Otero 2011: 2043).

As phonological processes reach the stem level, the effect of morphological and lexical factors becomes increasingly apparent. Postnasal /g/-deletion, for example, has already developed a number of interesting irregularities. The high-frequency adjectives *long*, *strong*, and *young* possess lexically listed synthetic comparative and superlative forms that unexpectedly retain [g]. The gradation suffixes *-er* and *-est* normally attach at the word level, and so the regular pattern is the one exhibited by [g]-less forms like *wro*[ŋ]*-er* and *winni*[ŋ]*-est* (Bermúdez-Otero, forthcoming: section 4.2.3). Conversely, exceptions to the prohibition of [ŋ] in morpheme-internal onset position have arisen from various sources, including the univerbation of former phrases and compounds, e.g. *Nottingham* [ˈnɒ.tɪ.ŋəm] (< *Snotinga hām*), *dinghy* [ˈdɪ.ŋɪ], *Menzies* [ˈmɪ.ŋɪs] *Campbell*. Relatedly, the absence of postnasal [g] in codas is now cyclically transferred to novel semantically transparent derivatives, even with stress-attracting suffixes, e.g. *Peki*[ŋ] → *Peki*[ŋ]*-ése* 'Peking dialect' (cf. *Peki*[n]*-ése* 'dog breed'), *swin*[ŋ] → *swi*[ŋ]*-ómeter*. Bermúdez-Otero (forthcoming: section 3.3) accounts for this pattern of irregularity (specially the link between cyclic misapplication at the stem level and exceptions in monomorphemic items) by means of the hypothesis that stem-level expressions are listed nonanalytically, i.e. as whole forms.

Eventually, a phonological process may be replaced by a purely morphological generalization (Anderson 1988: 329ff.) or disappear altogether, leaving a mere residue of lexical idiosyncrasies behind. Thus, OE *i*-umlaut, which once must have been a gradient process of vowel-to-vowel coarticulation, exists now only as the unproductive pattern of alternation found in *foot–feet, tooth–teeth, food–feed,* etc.

2.3 The life cycle of phonological processes and Minkova's riddle of phrasal syllabification
The life cycle of phonological processes, then, works like an escalator, continually lifting sound patterns from lower to higher components of the grammar:
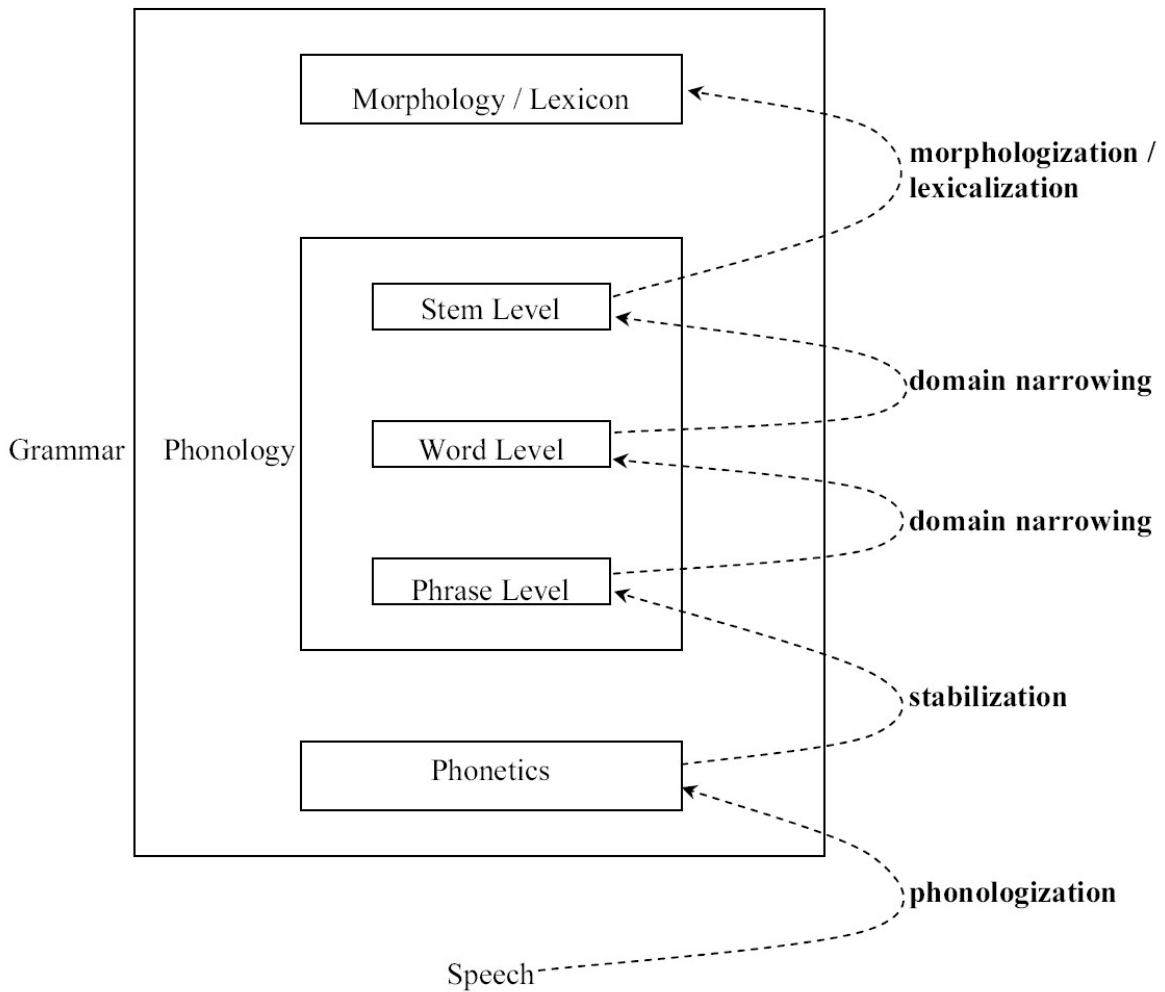
Figure 1. The life cycle of phonological processes

The prevalence of change along this pathway predicts some important tendencies. Notably, if the grammar contains two separate phonological processes corresponding to successive steps in a single lenition scale, and if the two processes have different cyclic domains, then the older rule, representing a milder form of lenition, may be expected to apply in narrower cyclic domains than the younger rule, representing a more aggressive form of lenition. This prediction casts new light on a classic problem in English phonology: the syllabic affiliation of word-final prevocalic consonants.

  Thanks to Minkova (2003: Chapter 4), we now have a solid understanding of phrasal syllabification in OE and ME. Minkova shows that, like present-day German, OE used [?]-epenthesis to repair stressed onsetless syllables. Since OE had root-initial stress, the

epenthetic glottal stop removed most opportunities for the resyllabification of word-final consonants before underlyingly vowel-initial content words:

(9) Ēadmund æþeling

  UR /æːɑdmund æθeliŋg/

  SR [ˈʔæːɑd.mund.ˈʔæ.ðe.liŋg], cf. *[ˈæːɑd.mun.ˈdæ.ðe.liŋg]

    lit.: Edmund prince
    'prince Edmund' (OED, *Brun* 3a)

Four main pieces of evidence support Minkova's account. First, OE metre allowed underlyingly vowel-initial stressed syllables to alliterate with each other regardless of vowel quality. This suggests that the glottal stop sufficed to satisfy the identity requirement imposed by alliteration. The glottal stop's allophonic status need not have prevented it from playing a crucial role in verse, especially if epenthesis took place at the stem or word level.

(10) [ʔ]**Æ**þelstān cyning [ʔ]**eo**rla dryhten

    lit.: Æthelstan king, noblemen's lord
  'King Æthelstan, lord of noblemen' (OED, *Brun* 1)

Secondly, a word-final unstressed open syllable was able to fill a weak metrical position in OE verse not only when followed by a consonant or a caesura, but also when preceding a stressed vowel in the same half-line. In the latter case, [ʔ]-insertion prevented the two vowels from coalescing (11a). Observe, in contrast, the crucial application of syllable fusion across word-boundaries in the Spanish hendecasyllable in (11b).

(11) a. ´‿ × ´‿ ×

    lan.g**e** [ʔ]**ā**h.te
    'long reigned' (OED, *Beo* 31b)

b. Era del año l**a e**stación florida

['e.ɾa.ðe.'la.ɲo.laḛs.ta.'θjon.flo.'ɾi.ða]

lit.: was of-the year the season flowery

'It was the flowery season of the year' (Góngora, *Soledades*, I, 1)

Thirdly, OE prefix-final vowels are always retained before stem-initial stressed vowels. In (12) we see an example in which this absence of contraction is essential for metrical well-formedness:

(12)   ⌐́ × ⌐́ ×

oft ġ**e**.[ʔ]æh.ted

'often praised' (OED, *Beo* 1885)

Significantly, contraction was confined to negative *ne* with prosodically weak verbs (e.g. *nis* 'is not') and *to be* with prosodically weak adverbs (e.g. *binnan* 'within'). Fourthly, it appears that Anglo-Saxon scribes sometimes used the letter <h> to notate the epenthetic glottal stop, e.g.:

(13)   <Ða se **h**ælmihtiga>
        'Then the Almighty' (OED, *GuthB* 950b)

Minkova argues convincingly that this "inorganic <h->" did not arise from sociolinguistic hypercorrection for /h/-loss: /h/-loss only became active later; the insertion of unetymological <h-> was not accompanied by omission of etymological <h->; and inorganic <h-> occurred more frequently in verse manuscripts (where prosodification was crucial) than in prose.

During the ME period, however, [ʔ]-epenthesis became optional, triggering a concomitant surge in the resyllabification of word-final prevocalic consonants. Minkova identifies several symptoms of this change, of which we shall highlight four. First, the overall incidence of vowel alliteration in alliterative verse (10) dropped dramatically, from 15.5% in *Beowulf* to a mere 2.1% in *Wynnere and Wastoure*. Just as significantly, the proportion of cases involving vowels of the same quality increased, suggesting that [ʔ] was no longer available to satisfy identity requirements in verse. Secondly, word- and prefix-final vowels

became targets for elision and contraction, and these phenomena were often crucial to well-formedness in syllable-counting metres:

(14) a. W S W S   W S W S

þatt Godess Sun**(e) A**llmahhtiȝ Godd

'that God's Son Almighty God' (OED, *Orm* 11042)

  b. W S W S   W S W

þin blettsinng **tu**nnderrganngenn

lit.: thy blessing to-undergo

'to receive your blessing' (OED, *Orm* 10661)

Thirdly, ME alliterative metres occasionally allowed a word-final consonant resyllabified into the onset of a stressed syllable to carry the alliteration:

(15)   Vmquile he **n**oys as a **n**owte ‖ as a**n‿**ox quen he lawes

'At-times he moans like a bull, like an ox when it lows' (OED, *Wars Alex.* (Ashm) 4744)

Turville-Petre (1989: 200) observes that, in this example, "The scribe writes *a nox*, to indicate the alliteration". Fourthly, ME saw a large increase of "false junctures", in which resyllabified word-final consonants are misparsed as word-initial, e.g.:

(16) a**n** eke name   >   a **n**eke name
      'an extra name'   'a nickname'

The evolution of phrasal syllabification during OE and ME thus appears fairly straightforward. In OE, word-final consonants followed by underlyingly vowel-initial words behaved as codas because the glottal stop blocked resyllabification. In ME, the decline of [ʔ]-epenthesis enabled such consonants to be resyllabified as onsets. Unexpectedly, the main problem arises when one tries to follow up Minkova's narrative into the Modern period, for in PDE word-final prevocalic consonants display both onset-like and coda-like properties.

The lateral approximant /l/ provides a clear example. First, word-final prevocalic /l/ behaves like a coda in many present-day dialects in that it undergoes darkening, which we

here define as the phonological process whereby the segment's DORSAL feature replaces the CORONAL node as the designated primary articulator, causing the tongue-dorsum gesture to be phased before the tongue-tip gesture in articulation (Sproat and Fujimura 1993). Darkening affects /l/ in canonical coda positions, but does not apply to canonical onsets. At the same time, however, many varieties of English display a categorical process whereby /l/ is realized with midsagittal coronal closure before vowels, but without linguoalveolar contact before consonants or pause. We retain the traditional designation of "/l/-vocalization" for this process, without prejudice to the question whether the relevant phonological feature is [consonantal], [continuant], or some other. Crucially, word-final prevocalic /l/ resists vocalization in many – though not all – accents (Scobbie and Wrench 2003), and in this respect patterns like an onset. Word-final prevocalic /l/ thus behaves neither like a canonical onset nor like a canonical coda. The dilemma is summarized in Table 2.

Table 2. Onset-like and coda-like properties of word-final prevocalic /l/

Position	Example	Realization		
/…V#__V…/	*see Lynn*	[l]	linguoalveolar contact	dorsal lag
/…V__#V…/	*seal in*	[ɫ]	linguoalveolar contact	dorsal lead
/…V__#C…/	*seal bins*	[ɫ̝]	no linguoalveolar contact	dorsal lead

One might conceivably respond to this situation by asserting that word-final prevocalic /l/ is ambisyllabic, but this solution has been shown to be unsatisfactory (Bermúdez-Otero 2011: 2038–39). When one considers the facts in the light of the life cycle of phonological processes, however, the difficulty vanishes. The key lies in the observation that darkening and vocalization constitute successive steps in a single lenition scale for liquids:

(17)   l $>_{\text{darkening}}$ ɫ $>_{\text{vocalization}}$ ɫ̝   ($>_{\text{deletion}}$ ∅   )

The rule of darkening is therefore historically older (i.e. it reached the stabilization stage earlier) than the rule of vocalization. Accordingly, if the two processes have different cyclic domains, we predict darkening to apply at a higher level than vocalization, since darkening

got on the escalator in Figure 1 well before vocalization did. This is precisely what one finds: darkening applies at the word level; vocalization, at the phrase level.

(18) *see Lynn* *seal in* *seal bins*

⟦PL ⟦WL siː⟧⟦WL lɪn⟧⟧ ⟦PL ⟦WL siːl⟧⟦WL ɪn⟧⟧ ⟦PL ⟦WL siːl⟧⟦WL bɪnz⟧⟧

WL (coda darkening)	.lɪn.	.siːɫ.	.siːɫ.
PL (coda vocalization)	.siː.lɪn.	.siː.ɬɪn.	.siːɫ.bɪnz.

Thus, the phrase-level process of prevocalic resyllabification that entered the grammar in ME has never gone away. However, between ME and the present day, relatively old coda lenition rules like /l/-darkening have undergone domain narrowing in line with the life cycle of phonological processes.

Incidentally, this account easily accommodates several observations deemed problematic by Scobbie and Pouplier (2010). First, /l/-vocalization is a relatively young process, and so it can still be observed in the early stages of its life cycle in some dialects, much as in the case of /n#k/ sandhi in (5). The most conservative varieties (e.g. speakers S5 and E2 in Scobbie and Pouplier 2010) lack vocalization altogether. In contrast, the most advanced speakers (e.g. S1, S2, S3, and S4) have word-level vocalization, and so produce [ɫ] even in word-final prevocalic position. Between these extremes, however, Scobbie and Pouplier found not one but two intermediate systems. Speakers with categorical phrase-level vocalization, as per (18), produce word-final /l/ with linguoalveolar contact variably before vowels, and vocalize it before all consonants, including /h/ (e.g. S1 and S3). In contrast, other speakers (e.g. E5 and E3) preserve linguoalveolar contact both before vowels and before /h/. The latter group can plausibly be understood as reflecting a stage of /l/-vocalization before stabilization, in which the rule does not refer to categorical properties of suprasegmental representation at SR, but to phasing relations between oral gestures in Articulatory Form. At this stage, /h/ is transparent to vocalization because it does not contribute oral gestures.

In sum, the diachronic evolution and synchronic behaviour of English word-final prevocalic consonants can be fully understood only against the background of the life cycle of phonological processes. It should be as inconceivable for phonetic, phonological, and morphological research to proceed in ignorance of this life cycle as it is for research into morphology, syntax, semantics, and pragmatics to ignore the facts of grammaticalization.

2.4 A note on unidirectionality: Child-driven vs adult-driven phonological innovation

We have described the life cycle of phonological processes as largely unidirectional. Exceptions to this statement do indeed seem extremely rare, but the literature furnishes some plausible counterexamples. For instance, the English dialect of New Orleans exhibits a phonological process of æ-tensing whose origins are to be sought in a stem-level rule of the New York vernacular (Labov 2007: 364–69). Crucially, it appears that, at some point in the evolution of the New Orleans process, certain speakers internalized a word-level generalization instead of the original stem-level rule. In New York, æ undergoes tensing before coda nasals, but a stem-final nasal immediately followed by a vowel belonging to a word-level suffix counts as a coda because tensing applies in stem-level domains, where word-level suffixes are not visible. In New Orleans, in contrast, æ becomes tense even before onset nasals, presumably because a generation of New Orleans speakers interpreted opaque tensing before stem-final prevocalic nasals as the transparent outcome of a word-level rule (Labov 2007: 369):

(19)   *New York*   *New Orleans*

      (Cardinal) Manning   ⟦$_{WL}$ ⟦$_{SL}$ Manning⟧⟧   [æ]   [æ:]

      mann-ing (the pumps)   ⟦$_{WL}$ ⟦$_{SL}$ man⟧ ing⟧   [æ:]   [æ:]

The descent of the New Orleans rule from the stem to the word level violates the unidirectionality of the life cycle of phonological processes. Nonetheless, Labov demonstrates that the propagation of æ-tensing from New York to New Orleans was mediated by linguistic contact between adults. Accordingly, responsibility for the reanalysis of opaque forms like *m*[æ:]*nn-ing* can plausibly be imputed to adult innovators. This account accords well with the generalization that, although change remains possible throughout the lifespan, deep or large-scale structural innovations are rare after adolescence (Kerswill 1996). Dinkin (this volume) pursues the same idea in his account of the life cycle of vowel shifts.

2.5 A note on gradience: Rule scattering

So far, we have explained the life cycle of phonological processes in terms of the modular architecture introduced in (4) and elaborated in Figure 1. This architecture predicts that generalizations over continuous phonetic dimensions must apply across the board, and that

processes confined to particular cyclic domains must be categorical. In consequence, the modular architecture faces an empirical challenge from reports of sound patterns that appear to be at once phonetically gradient and morphologically sensitive (Kawahara 2011: section 2.3.3). English /l/-darkening is a case in point. The derivation shown in (18) requires darkening to apply at the word level, but Sproat and Fujimura (1993) describe darkening as a gradient articulatory adjustment delaying the tongue-tip gesture in proportion to the duration of the rhyme. The difficulty disappears, however, if the relevant grammars contain not one but two cognate processes of /l/-darkening: one categorical and sensitive to morphosyntactic domains, the other gradient and sensitive to rhyme duration (Bermúdez-Otero 2007: note 6). Crucially, there are good reasons to believe that such two-rule systems arise naturally in the life cycle of phonological processes by "rule scattering". In particular, the stabilization of a gradient phonetic pattern often leaves the old process *in situ* even as a new distribution of discrete categories emerges at SR (Bermúdez-Otero 2007: 506). Zsiga's (1995) study of pre-yod palatalization provides a clear example. The grammar of PDE turns out to contain two cognate palatalization rules: a fully neutralizing process confined to stem-level domains (e.g. *confe*[ʃ]-*ion*), and a gradient nonneutralizing process of coarticulation applying across the board (e.g. *press you* [pɹɛsju:]). The phenomenon of "layering" in grammaticalization (Hopper 1991: 22) offers a highly suggestive parallel.

Controversy still surrounds the ways in which factors such as token frequency, neighbourhood density, and contextual predictability affect fine phonetic detail. The proponents of exemplar theory regard classical grammatical architectures as falsified by these effects (see e.g. Hay and Clendon, this volume). However, there are alternative accounts of these phenomena that preserve modularity by various means, including speaker-internal mechanisms like cascading activation (Goldrick 2006) and listener-oriented mechanisms like hypo- and hyper-articulation (Lindblom 1990).

3.   Continua, cycles, and English historical morphosyntax

As hinted in section 1, there are parallels between recurrent pathways of change in phonology and in morphosyntax. Thus it is unsurprising that similar problems concerning unidirectionality and gradience should arise in both domains. In morphosyntax, the basic issues can be readily brought into focus by considering familiar grammaticalization "clines" (Hopper and Traugott 2003: 6) such as that represented in (20):

(20)   content word   >   grammatical word >   clitic   > affix >   zero

One fundamental question concerns the status of the steps in this cline. Are we to think of them as distinct macro-categories, as cover terms for groups of more fine-grained micro-categories, or as arbitrary cuts in a continuum? Addressing these questions requires us to tackle the relationship between diachronic gradualness in grammaticalization and the nature of synchronic gradience (Traugott and Trousdale 2010). In section 3.1 we survey some of the difficulties encountered by linguists as they have sought to rethink clines in terms of their component micro-changes. It also requires us to think about what it would mean to postulate a lexicon-syntax continuum (see Broccias, this volume, and section 3.2, where we discuss idioms).

Furthermore, as a linguistic item moves down a cline such as (20), losing semantic and phonetic content, a process of renewal may take place; a different expression may begin to develop a polysemy which may be interpreted as having a grammatical meaning, and the process begins again. Thus, as *will* developed into the clitic *'ll*, a new construction *BE going to* emerged in the late ME period as an alternative way of marking futurity in English. *BE going to* has itself subsequently undergone reduction to *gonna* in some linguistic contexts. This has led to suggestions that grammaticalization is "cyclical" (see section 3.3 and Wallage, this volume). In discussion of cycles of grammaticalization, moreover, cyclicity has been aligned with unidirectionality: "thinking of change as cyclical assumes that it is unidirectional" (van Gelderen 2009: 3). But this immediately raises the question of what significance to attach to putative instances of degrammaticalization (see section 3.4).

We thus see that gradience and unidirectionality raise very similar questions in phonological and morphosyntactic change. We develop these parallels in more detail in section 3.5 and in our conclusion (section 4).

3.1   Continua

In minimalist approaches to morphosyntactic change (e.g. Roberts and Roussou 2003; van Gelderen 2009), change is a product of acquisition. Furthermore, changes are typically conceptualized as catastrophic, rather than gradual. Abrupt macro-changes can often be easily mapped onto the clines mentioned in the previous section. As Traugott and Trousdale (2010: 25) suggest, clines typically involve "broad changes (macro-steps) to distinct-seeming categories". Yet, as "generalizations over changes" (Andersen 2001: 214), clines may obscure the micro-changes which characterize the development of new grammatical categories. By way of example, we consider the development of the English modals, a "paradigm case" (Fischer 2007: 159) for rethinking aspects of the history of English morphosyntax. The changes which gave rise to PDE *can*, *should* and the like have been used as evidence for and against radical and catastrophic grammar change (compare the positions taken by Lightfoot (1979) on the one hand, and Plank (1984) on the other; see Fischer (2007: 159–209) for a comprehensive discussion).

Linguists of various theoretical persuasions accept that there was a series of changes which affected the precursors of the PDE modals (the premodals) from OE onwards. In earlier periods, premodals had "lexical" properties associated with typical verbs. For instance, they took NPs as direct objects (21), and their past tense forms were used to make reference to past time (22):

(21)   þæt he geornor wolde sibbe wið hiene þonne gewin

         lit.: that he sooner wanted peace with him than conflict

         'that he wanted peace rather than conflict with him' (OED, *Or* 3 1.96.17)

(22)   þa wolde he hiene selfne on þæm gefohte forspillan

         lit.: then wanted he him self on that battle to-destroy

         'then he wanted to destroy himself in the battle' (OED, *Or* 3 9.128.5)

Over time, *would* and other central modals no longer had these lexical properties. Further changes (such as their failure to appear in non-finite forms) meant that these linguistic items became atypical of lexical verbs. Linguists disagree, however, on other aspects of the changes involved. Lightfoot (1979) considered the changes affecting the modals to be an indication of a radical restructuring of the grammar by acquirers of English. Others (e.g. Plank 1984; Warner 1993; and Lightfoot himself in 1991, 1999) argue that the developments suggest a

more gradual recategorization of the linguistic forms over time. We consider three pieces of evidence for this more gradual change below.

First, there is evidence that in OE, the premodals already had a number of characteristics associated with auxiliary verbs. For instance, some (e.g. *motan*) never appear in non-finite form in OE (Warner 1983); and in some uses of the OE premodals, the expression of deontic modality is very clear:

(23)   and we sceolan gehyhtan on Godes þa gehalgodan cyricean

         lit.: and we must trust in God's that blessed church

         'and we must trust in God's holy church' (OED, *BlHom*. X. 111.8–9)

Such evidence suggests that "auxiliary" properties of these forms are attested in OE. Conversely, "lexical" properties of such forms persist well into the PDE period: Visser (1963–73: §§551, 557–58) gives examples of NP-complements of *shall* and *can* in the EModE period, and *will* in the LModE period. Second, there are counterexamples to the shift "lexical verb > auxiliary verb" in ME, with some forms acquiring more rather than fewer lexical features. Warner (1993: 101–2) shows that *sculleþ* and *cunneþ* are ME innovations where the forms have developed new present tense inflections. Third, different modals lost the association between past tense form and past time at different stages (Goossens 1987; Fischer 2007). This change affected **sculan* in OE, while *could* and *would* have vestiges of this association even in PDE.

This evidence argues against a very abrupt shift from lexical verb to auxiliary verb in the case of English modals. The premodals of OE were already unusual verbs, but some acquired more properties associated with lexical verbs in the ME period, rather than fewer. Most crucially, the loss of lexical features and the acquisition of grammatical ones were not uniform across the set: individual premodals acquired individual grammaticalized properties at different stages in the history of the language. Fischer and van der Wurff (2006: 151) suggest "that within the verbal class there is a continuum running from full verbs to auxiliary-like verbs", and the distribution of grammatical properties varies across the set of PDE auxiliaries, including the modals. Pre-empting the discussion of cycles in grammaticalization (sections 3.3–3.4), we note here that research on on-going change in the English modal system suggests that there is some evidence of renewal through the co-option of semi-modal constructions (such as *have (got) to*) from the late ME period onwards, but that not all modals are declining at the same rate. Some of the core modals are remarkably robust, and some (e.g.

could) even appear to have increased in frequency during the twentieth century, at least in certain types of discourse (see Krug 2000; Leech et al. 2009; Millar 2009). This further supports Warner's observation that not all members of the set of auxiliaries behave in the same way, though the set as a whole is crystallizing as a basic-level category (Warner 1993: 209ff.).

3.2 Idiomaticization and the syntax-lexicon continuum

Recent developments in diachronic Construction Grammar have encouraged rethinking of how best to describe the development of lexical idioms, which lose syntactic flexibility but maintain or develop a referential meaning, in contrast to the kind of idiomatic development which creates grammatical constructions (such as *BE going to* as a future marker). Such developments illustrate the following properties associated with the syntax-lexicon continuum, understood in constructional terms (see Broccias, this volume; Goldberg, forthcoming; Wulff, forthcoming).

First, grammatical frames and words are seen as form-meaning pairings of different degrees of complexity and schematicity. A lexical monomorpheme such as *town* is less complex than, for instance, an instance of the Resultative Construction (Goldberg and Jackendoff 2004) such as *he painted the wall red*. A lexical verb such as *paint* is less schematic (i.e. more fine-grained in conceptual detail, Langacker 1987: 132) than the past tense morpheme *-ed*. Idioms (such as *he painted the town red* 'he engaged in a riotous celebration') sit in between the extremes of simple lexical items (e.g. *red*) and schematic constructions (e.g. the causative property resultative, with the syntax [NP_1 V NP_2 AP/PP_3], and the semantics "[X_1 CAUSE [Y_2 BECOME Z_3]], by means of the verbal subevent", Goldberg and Jackendoff 2004: 563) but idiomaticization may involve shifts towards either end of the continuum. The development of more schematic and complex constructions like *all*-clefts (where few slots are lexically specified, and where expansion increases the schematicity of the slots, on which see further section 3.5) creates a more grammatical construction, while the development of idioms like *safe and sound* 'securely', with reduction in collocational range and increase in specificity of the slots (when the whole is associated with a specific meaning), creates a more lexical construction.

Second, some types of constructions appear to involve shifts in both directions, though crucially not at the same time. For instance, patterns involving light verbs like *TAKE a walk* 'walk', *HAVE a bath* 'bathe', and *GIVE NP a kick* 'kick NP', while idiomatic, have developed more toward the grammatical end of the continuum, since the light verbs typically

have a telic function (see e.g. Brinton 2008). This development has been on-going since ME. However, extensions to this pattern in a subset of cases suggest a further shift towards the lexical end of the continuum: while *GIVE NP a bath/kick/shove* means 'bathe/kick/shove NP', *GIVE NP a talking to* does not simply mean 'talk to NP', but rather 'berate NP'. This development is a LModE phenomenon, occurring after the development of the more general light verb construction (Trousdale 2008).

Third, as noted by Sharma and Wiltshire (this volume), particular patterns that may lie toward the lexical end of the continuum in one variety may shift towards the grammatical end in another variety. In standard British English, for instance, *GIVE NP the slip* is more fixed (more lexical) than it is in some varieties of Indian English. In both varieties, *GIVE* may appear in any of its inflectional forms, and a wide range of NPs are permissible. However, in standard British English the order is *GIVE NP the slip* (*GIVE the slip to NP* would involve transfer of a piece of paper or ladies' underwear to the NP recipient), and the article preceding *slip* is definite, not indefinite; in Indian English, *he gave a slip to the police*, with the meaning 'he evaded the police', is well-formed. The notion of the syntax-lexicon continuum offers interesting possibilities for rethinking the nature of grammatical and lexical change.

3.3 Cycles and unidirectionality

The first issue we address in this section concerns the relationship between unidirectionality and cyclicity in grammaticalization. The essential feature of the hypothesis of unidirectionality is that morphological structures may develop from syntax, but syntactic structures will not develop from morphology. In her discussion of grammaticalization clines, van Gelderen (2011) suggests that renewal at the "end" of a cline is a cyclical process. An example of this "unidirectional cycle" is the definiteness cycle in Germanic (van Gelderen 2007), whereby demonstratives (located as specifiers in a Determiner Phrase) come to be reanalysed as heads (i.e. articles in D).

Van Gelderen (2007) observes how the cycle applies to the development of definite markers in the history of English, in terms phonetic reduction in one case, and renewal in another. The present-day definite article *the* derives ultimately from the OE demonstrative paradigm *se/seo/þæt*, which "covers the domains of both the demonstrative *that* and the determiner *the* in PDE" (Traugott 1992: 172). There is evidence from EModE that *the* undergoes a shift from head to clitic (rendered orthographically as *th'* or *t'*):

(24)   Th'ambassadors from Norway, my good lord,

      Are joyfully return'd (*Hamlet* II.ii. 40–41)

This persists in contemporary dialects of British English, such as Lancashire:

(25) Oh yes yes they were a primary school (.) Miss Riley she were er (.) er in the/[θ] infants

    you see and then you went up to the/[?] big school

                            (Hollmann and Siewierska 2011: ex. 14).

Dialect data also show how proximal demonstratives are renewed in some varieties of English by the co-option of determiner + adverb sequences such as (26) from the BNC (Nottingham Oral History Project):

(26)   And me mother, she lived at, that's not far from Peterborough, and she er Me father

      used to go to **this here farm** (BYU-BNC)

      A number of critical points emerge from this view of grammaticalization cycles:
- While renewal by means of demonstrative+adverb may take place, it is clearly not the case that the original determiners must progress to zero (the right end of the cline) before renewal begins. There is no evidence that *this* has undergone any shift to a clitic in dialects where the reinforcement occurs.
- In the minimalist framework adopted by van Gelderen (2007, 2011), the changes are accounted for by specific postulates of the model. The first is the Head Preference Principle (whereby, in early language acquisition, given a choice where both options are available, the child will analyse an element as a head, rather than a phrase). This is seen as comparable with other efficiency principles such as Hawkins' (1994) Minimize Forms, and is instantiated by the shift from specifier (demonstrative) to head (article). The second is the Late Merge Principle: Merge is "a binary operation that recursively combines elements, thereby building phrase structure" (Roberts and Roussou 2003: 17). Merging late is said to be cognitively more economical because it avoids the movement of a piece of phrase structure created earlier in the derivation which may itself be required to merge subsequently. This is instantiated by the incorporation of adverbs like *here* and *there* as specifiers as in (26). These principles may also be interpreted as changes in feature

specifications (van Gelderen 2007), namely shifts from interpretable to uninterpretable features, where the former have semantic content, and the latter are purely formal.

Jespersen's (1917) account of sentential negation (on which see further Wallage, this volume) provides another well-known example of cyclicity in grammatical change: increasingly weak markers of negation (for example, OE *ne*) are strengthened by the use of other negative markers (such as OE *naht*). Such strong markers themselves weaken over time (consider the development of OE *naht > not > n't*), and the cycle repeats, e.g. when the negative adverb *never* (OE *næfre* 'not on any occasion') is used in contemporary English as a semantically bleached negator (for example, *I never ate those crisps* 'I didn't eat those crisps').

The nature of this cycle has been subject to a number of investigations in recent years, particularly from a formal syntactic perspective (e.g. Roberts and Roussou 2003). Issues include the nature of negative phrases (see Haegeman 1995), particularly whether the feature on Neg is interpretable or uninterpretable (on which see further Wallage, this volume). Van der Auwera (2009) considers the literature on whether phonetic erosion and weakening of the original negator was the impetus for strengthening elsewhere in the system, which then led to semantic bleaching of the original negator (Jespersen's position), or whether pragmatic emphasis was the first stage (a position proposed by Meillet (1912), for instance – see further van der Auwera (2009: 42–43)). Van der Auwera (2009) also proposes a series of possible cycles of negation in some of the histories of languages of the world. A unified cycle may be something of an illusion, and is rather the consequence of a limited set of choices available to language users when negative polarity items grammaticalize into negation markers. Each individual development is different, but the total effect appears to be cyclic because the language system imposes constraints on possible positions for negative forms.

3.4 Directionality in grammatical change and degrammaticalization
In section 2.4, we discussed the nature of unidirectionality in the life cycle of phonological processes, and observed that:

- counterexamples to the unidirectional processes are rare;
- counterexamples seem to be the product of adult interaction, rather than a feature of innovations driven by children.

In grammaticalization research, unidirectionality has been typically discussed in relation to the kinds of cline exemplified by (20) above. We will not rehearse all aspects of the unidirectionality debate here (see Hopper and Traugott (2003) and Norde (2009) for useful overviews). Rather, we will concentrate on the rare phenomenon of degrammaticalization, and its importance for rethinking aspects of the history of English morphosyntax. Grammaticalization clines are usually understood to be directional, and synchronic layering is a product of that directionality (in the way that rule scattering is a product of directionality in phonological change). Our topic in this section concerns degrammaticalization and counterexamples to unidirectional changes in morphosyntax.

Some developments in the history of English have been claimed to be examples of degrammaticalization because they involve a shift from a grammatical category (such as preposition) to a lexical category (such as verb), as in *up the offer* 'raise the offer', or *out a film star* 'identify a film star as homosexual'. Following Norde (2009), we do not consider these examples to be instances of degrammaticalization, but rather of conversion, a word-formation process. Degrammaticalization is "a composite change whereby a gram in a specific context gains in autonomy or substance on more than one linguistic level (semantics, morphology, syntax, or phonology)" (Norde 2009: 10). Examples of degrammaticalization are rare, not just in English. The most widely-discussed of instances of degrammaticalization in English is the development of the *s*-genitive (Allen 2008; Denison, Scott, and Börjars 2010), which is a kind of deinflectionalization "whereby an inflectional affix in a specific linguistic context gains a new function, while shifting to a less bound morpheme type" (Norde 2009: 152). In (27), the OE affix is compared with the PDE clitic:

(27a) anes   eorðliches   monnes   heste
       a-MASC.SG.GEN earthly-MASC.SG.GEN   man-MASC.SG.GEN command
                                                            (MED, *Lamb.Hom.*)

(27b) [an earthly man]=s command
       'an earthly man's command'

(27c) [the man over there]=s dog
       'the man over there's dog'

Unlike the exceptions to directional processes in phonological change, there is no evidence that degrammaticalization is a product of adult-driven innovation as opposed to reanalysis on the part of the child. Degrammaticalization is relevant to the present discussion because of debates regarding unidirectionality and gradualness in the development of more grammatical and more lexical items: Kiparsky (forthcoming), for instance, suggests that grammaticalization is unidirectional (when properly understood as non-exemplar, Universal Grammar-based analogy), and that all instances of degrammaticalization are modelled on existing exemplars and constitute "ordinary" analogical change; Norde (2009) argues that degrammaticalization is a gradual process, a composite change made up of several primitive changes.

3.5 Comparing the life cycle of phonological processes and grammaticalization

In this final section, we explore similarities between the life cycle of phonological processes and stages of grammaticalization. We begin with a comparison of the early stages of the phonological cycle (phonologization) and the early stages of grammatical change. Recall that in phonologization, a mechanism beyond human cognitive control contributes to the emergence of a new language-specific (cognitively controlled and grammar-internal) generalization. We consider a development in which aspects of sentence-external discourse context come to be incorporated in a new grammatical construction. An instance of the modern English construction which is the output of this kind of change is (28):

(28)   All I did was boil the kettle.

All-clefts such as (28) share a number of properties with other pseudo-clefts like *wh*-clefts (Prince 1978; Lambrecht 2001; Huddleston and Pullum 2002): they are traditionally seen as biclausal, with a pro-verb *do*, and contain some given or recoverable element (usually in the reduced relative clause); the focus element (following the copula) is understood as exhaustive. However, in *all*-clefts, the focus element is typically conceived by the speaker to be inadequate ("downward inferential" in the terminology of Horn (1996: 18), since *all* no longer means 'everything').

Precursors to *all*-clefts in the EModE period, exemplified by (29), are different in a number of ways (examples (29)–(31) from Traugott 2008):

(29)   I loue thee dearer then I doe my life,

And **all I did, was to advaunce thy state**,

To sunne bright beames of shining happinesse

(Early English Books Online (EEBO), Yarington, *Two Lamentable Tragedies*, 1601)

Here, *all* means 'everything', *do* is not a pro-verb, and so on. (29) may be usefully contrasted with the following unambiguous example of an English *all*-cleft:

(30)   there is no possibilitie of overthrowing the new election […] **all you can doe is to do some good for the tyme to come**,

(Corpus of Early English Correspondence Sampler (CEECS), Oliver Naylor, *Letter to John Cousin*, 1624)

This is clearly an example of grammaticalization, in that an information-packaging structure has become fixed (Lehmann 2008), and the action verb *do* in (29) develops a pro-verb function as in (28). In the data analysed by Traugott (2008), *all* is anaphoric to a proposition that is contested in some way. A contesting (or dialogic) context appears to be central for the development of this particular construction. This parallels the coming-into-being of a phonetic rule in a speaker/hearer interaction whereby the hearer interprets a mechanical speech effect as a cognitively controlled process. In the case of *all*-clefts, a discourse-specific contesting context comes to be syntacticized when a construction becomes part of the grammar. In the life cycle of phonological processes, the phonologization stage is followed by a stabilization stage, which we defined above as the diachronic process whereby a gradient phonetic rule is reinterpreted as a generalization over discrete categories in the phonological surface representation. Likewise in this case, certain parts of the new *all*-cleft construction "stabilize" and involve the fixing of a particular pattern of information structuring: it is a characteristic of all *all*-clefts to have exhaustive focus, and for *all* to mean "only", as noted above. Other parts of the construction, however, expand: in sixteenth- and early seventeenth-century English, the first verb in the construction was typically a verb of action (*do*) or a verb of locution (often *say*), but by the late seventeenth century, verbs such as *want* and *mean* appear (Traugott 2008); similarly, *to*-infinitive complements (as in *to do some good* in (30)) vary with bare infinitives from the early seventeenth-century:

(31)   Thy sonn's as well as anie man ith' lande,

Why **all he did, was bidd a man but stande**,

And told him coyne he lackt.

(EEBO, Goddard, *A Mastiff Whelp*, 1616)

A further parallel between stabilization in the life cycle of phonological processes and certain kinds of morphosyntactic change may be found in the relationship between "rule scattering" in phonological change and layering in grammaticalization (Hopper 1991). Recall that rule scattering involves the co-existence of a new (stabilized) phonological rule developing in the grammar, with an older phonetic process left *in situ*. Layering involves the co-existence in the grammar of older and newer constructions, which may interact (Hopper 1991: 22). Perhaps because of the absence of ambiguous contexts in the development of *all*-clefts, layering in this particular fragment of the grammar of contemporary English is less frequent, though some constructions such as (32) illustrate surface similarity between cleft and non-cleft constructions:

(32)   All I have is yours
          a. 'The only thing I have is the one that belongs to you' = *all*-cleft
          b. 'Everything I own belongs to you' ≠ *all*-cleft

The final parallel to be explored between the life cycle of phonological processes and grammatical change concerns the narrowing of cyclic domains. In phonological change, we saw that as a phonological rule ages, it may develop increased sensitivity to aspects of morphosyntactic structure. This may be described as "domain narrowing", applying (for instance) at word level rather than at phrase level. There are two significant points to be made here regarding the parallel with grammaticalization.

The first of these is that grammaticalization is sometimes conceived of as expansion (e.g. Himmelmann 2004), sometimes as reduction (e.g. Lehmann 1995; see also Fischer 2007). Expansion models of grammaticalization observe that as a construction ages, it may increase its collocational range (e.g. the development of *BE going to* as a future marker in English, which first collocated with action verbs, before extension to statives), and aspects of its pragmatic or semantic function (e.g. the development of epistemic modality in the use of *will* in examples such as *boys will be boys*). Reduction models of grammaticalization tend to focus on form, and particularly on changes (specifically, increase) in formal dependency, and phonetic attrition.

The second concerns the rather more intriguing parallel between morphologization in the end-stage of a phonological process, and morphologization in late stage, or secondary, grammaticalization (i.e. the development of more grammatical forms from less grammatical forms). The term "morphologization" has a number of uses. From the perspective of grammaticalization, the term is usually used to refer to the development of clitics into inflections (Hopper and Traugott 2003: 140). In discussion of the vestiges of *i*-mutation in English, Hopper (1994) sees the development of non-causative/causative pairs such as *drink–drench* and *sit–set* as the end stages of a grammaticalization process (see also Brinton and Traugott 2005: 54).

4. Conclusion

In this chapter we have surveyed the properties of recurrent pathways of linguistic change, as instantiated in the history of English. In our conclusion we wish to highlight three ideas emerging from this survey.

- There are very strong similarities between grammaticalization and the life cycle of phonological processes, which in all likelihood reflect deep facts about the nature of grammar and the causes of change in both domains.
- Understanding unidirectionality and its exceptions requires us to understand the cognitive capacities of speakers participating in language change, whether children in acquisition or adults in language use.
- At least some instances of synchronic gradience emerging from directional change can be understood as the consequence of layering of conservative and innovative patterns in the grammar.

Consideration of recurrent pathways of change is likely to remain central to any serious attempt to rethink the history of English. As we have argued in this chapter (e.g. section 2.3), a proper understanding of such pathways can hold the key to long-standing puzzles in English historical linguistics.

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