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SHARING MAKES US STRONGER*
PROCESS INHIBITION AND SEGMENTAL STRUCTURE

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1. *Introduction*

This piece takes inspiration from two strands of phonological thought. One of these is the tradition of work which recognises that 'lenition' processes can be theoretically insight-offering and interesting, and the other is one of the main traditions that have been established in the analysis of the internal structure of phonological segments. Both can be traced back to work by John Anderson. In what follows I do not blindly follow that work, nor indeed any off-the-peg phonological framework, but the model of segmental structure that I assume connects with an Anderson-influenced tradition which has become one of the most influential in this area (especially in European research culture), and the types of processes discussed in this article all have clear characteristics in common with cases of lenition, so they fit in with an identifiable Anderson-Lass-Harrisian tradition of interest (see e.g. Lass & Anderson 1975; Lass 1984; Anderson & Ewen 1987; Harris 1990, 1994).

The tradition of work on segmental structure (i.e. on 'melody') referred to above exists in both 'narrow' and 'broad' versions. The narrow version includes Anderson's own work and that of close co-workers and colleagues in the Dependency Phonology (DP) framework (e.g. Anderson & Jones 1974; Anderson 1980; Anderson & Durand 1986; Anderson & Ewen 1987). The broader version includes the cross-fertilisation which has occurred between DP ideas and those of cognate frameworks, such as Government Phonology (GP) and its offshoots. The whole tradition can be labelled the DEPENDENCY/GOVERNMENT approach to segmental structure; it recognises that melodic phonological representations are best conceived of in terms of a set of privative

* Earlier versions of some of the material in this article were included in Honeybone (2001, 2002, 2003), and a talk at the 9th International Phonology Meeting at the University of Vienna in 2002. Thanks are due to those who responded to either of these, particularly Phil Carr and Tobias Scheer, although no-one should necessarily be assumed to agree with any of this.

primes which are not many in number and which are each 'used' in several ways in the structure of segments, perhaps providing one particular property in vocalic segments and a different, but related, property in consonants.

The investigations to follow explore aspects of the dependency/government approach and present a set of results which, I argue, are best interpreted in line with this tradition, thus providing some further evidence in its favour. The phonological phenomena considered here are by no means entirely new, but they have not been adequately, coherently or collectively pursued before to the extent that they deserve. This is in part because previous work has not recognised the degree to which they are connected. I argue that the phenomena discussed here (extracted from synchronic and diachronic data from Liverpool English, High German, Spanish and Southern English English) are essentially manifestations of the same kind of phonological effect. They are all cases where phonological processes of one long-recognised type do *not* occur – that is, this paper studies phonologically conditioned exceptions to phonological processes, for the most part ignoring the precise nature of the processes themselves. I call this the study of 'process inhibition'. In all of the cases discussed here, melodic representations of the type provided by the dependency/government tradition provide an explanation for the patterns of process inhibition that they display. At least, they do once one key theoretical assumption is made: that the sharing of melodic material confers positional 'strength' on a segment. I make that assumption in this article, take steps towards its formalisation and show that it is, indeed, a predictive principle, which can thus reasonably be claimed to 'explain' the exceptions encountered.

DP and GP, like other phonological frameworks, consider much more than segmental melody, of course. Prosodic (or 'suprasegmental') phonology needs, in the greater scheme of things, to be tied in with the models assumed for melodic ('subsegmental') structure, but I put aside most issues of prosody here, only sketching out the basic patterns which can be observed in prosodic process inhibition. This may seem perverse – as we will see, most previous work on process inhibition has dealt with prosodic phenomena – but it is precisely because most previous work has focused on prosodic issues that this article skirts over them, in order to be able to better investigate the melodic generalisations which are too frequently ignored.

The article is structured as follows: in §2, I set out the basic representational and other phonological assumptions that I make, focusing in particular on the representation of segmental 'place'. In §3, I introduce the types of processes to be discussed in the article, and the notion of process inhibition. §4 considers the key generalisations that can be observed in process inhibition (dealing briefly with those that are due to prosodic factors and, then, in some detail, with those due to melody) and sets out the promised explanatory principle for melodic process inhibition. §5 tests this proposal, firstly through the consideration of three 'straightforward' case studies, and then through the lens of two more interesting cases, which go on to show how it can be put to use to provide novel argumentation in the field of segmental structure. §6 concludes.

2. *Prosody, melody and segmental structure*

Most of the novel discussion to come in this article derives from a consideration of the structure of the phonological segments involved, and, most specifically, of the interaction of this with the melodic environment in which they occur. This section sets out the assumptions which I make in this area, to the extent necessary to place the coming discussion in its context. As explained above, these principally derive from the dependency/government tradition, perhaps most importantly from the idea that phonological representations are best constructed using a set of privative units, which are typically 'bigger' than binary-valued distinctive features. I also touch on certain basic assumptions from the realm of prosody in this section, and on aspects of the interaction between prosody and melody. (Many of the assumptions made here are quite common in phonology, and can be fairly straightforwardly adapted to fit with other theoretical frameworks.) Although concerns of melody are to take centre stage in this article, I deal first with prosodic issues, in §2.1; the subsequent §2.2 deals with the relevant issues of melody.

2.1 *Prosodic assumptions*

Perhaps the most basic assumptions in the field of prosody explain which areas the term covers. I assume here that prosody is concerned with at least (i) the status of word and syllable boundaries, (ii) the positions that segments take up in syllabic constituents and the question of how these relate to linear adjacency in a word, (iii) the ways in which syllables can be grouped together into higher units such as feet, (iv) the quantity or length of segments, expressed through phonological 'timing slots' or moras, and (v) phonological stress and intonation. Most of these points will not be crucial here, although the influence of lexical stress and the role of lexical and syllabic position will feature briefly. More important will be issues of type (iv), where prosody and melody interact, and where melodic material is shared over more than one prosodic position. This is explored and explained in the following subsection.

In the coming discussion, it will often be helpful to recognise the set of principally prosodically defined environments given in (1). While not exhaustive, and at times overlapping, these environments are chosen partly following Ségéral & Scheer (2001) and also in comparison with the largely compatible templatic approach of Macken & Salmons (1997) and Holsinger (2000); they are also discussed in greater detail in Honeybone (2001, 2002, 2003). The following abbreviations are used in (1): # = word boundary; c = any consonant; v = any vowel; v́ = any stressed vowel.

(1) A [__#] 'word-final'
B [__c] 'preconsonantal' *and/or* 'coda'
C [v__v] 'intervocalic' *or* 'medial'
C1 [v́__(v)] 'foot-internal'
C2 [(v)__v́] 'foot-initial'
D [c__] 'postconsonantal' *and/or* 'onset'
E [#__] 'word-initial'

Most of these environments are quite uncomplicated: environments A, C1, C2 and E are fundamentally characterised by prosodic concerns, and while environments B and D can also be conceived of in prosodic terms, it is here that we might also expect melodic effects to be relevant. Below we will see that this is indeed the case (as will also be seen to be the case in subcases of C, where consonants interact with vowels). I turn now to introduce the model of melodic representation that will be necessary for us to recognise these effects.

2.2 *Melodic assumptions and conventions*

As advertised above, assumptions in the field of phonological melody will play an important role in what follows. To tighten the focus: the issues addressed here all relate to the characterisation of segmental 'place' (or, in the terms of Anderson & Ewen 1987, to the 'locational articulatory subgesture'). The dependency/government approach to such issues offers a range of proposals concerning the number and nature of subsegmental melodic units needed. These all differ from those approaches which stayed closer to the tradition of Chomsky & Halle (1968), such as much of feature geometry, which deal with binary-valued distinctive features that are 'small' in size, specifying only one detailed characteristic of a segment. The dependency/government approach typically employs 'larger' melodic primes, which are correspondingly fewer in number, and which may play several phonological roles in segments, specifying several segmental characteristics.

The dependency/government approach was developed first in Andersonian DP texts (see especially Anderson & Jones 1974; Anderson & Ewen 1987), and has since been developed in various ways by others (e.g. Lass 1984; Smith 1988, 2000; van der Hulst 1989, 1994a, 1995; van de Weijer 1996; van der Hulst & Ritter 1999b; Botma 2004). The approach adopted in GP developed separately at first (in Kaye *et al.* 1985, 1990), although it was then already compatible in many ways with DP, and the two frameworks have since exchanged ideas (see e.g. Harris 1990, 1994; Scheer 1998; van der Hulst & Ritter 1999b; Botma 2004). Similar argumentation and conceptual machinery can also be found in particle phonology (e.g. Schane 1984a, 1995, this volume), and, in part, in the drive for privativity that has featured in some theories of Feature Geometry (e.g. Lombardi 1991; Steriade 1995).

In the dependency/government approach, subsegmental units have gone by a number of names and have been transcribed using a range of notations. In Andersonian DP, those relevant here are labelled 'components' and are written between vertical lines. In GP, they are called 'elements' and are written simply as capital letters. Latter-day GP-influenced DP, such as van der Hulst (1999a) and Botma (2004), also use the term 'element' to describe its subsegmental units. I adopt this GP term here, but enclose the units in vertical lines, as in DP.

The key features of the dependency/government approach relevant here are that: (i) elements are privative, (ii) the same elements can occur in consonants and vowels (i.e. under onsets and nuclei), (iii) because elements are 'bigger' than distinctive features, segments can consist of just one element, and, on the other hand, (iv) segments can be built up from more than one element. Issues of headedness or dependency among melodic units (which are normally assumed in this tradition of analysis) will not be crucial here, and are thus put aside.

The initial insight, shared by practically all strands of the dependency/government approach, is that the basic, most common vowels are made up of only one element each. These elements can also combine to create more complex, less common segments. This is shown simplistically, but in a fashion familiar from DP and GP texts, in (2), where segments are enclosed in slanted slashes and their component elements in vertical slashes.

(2) /i/ = |i| /e/ = |i|+|a|
/a/ = |a| /o/ = |u|+|a|
/u/ = |u| /y/ = |u|+|i|

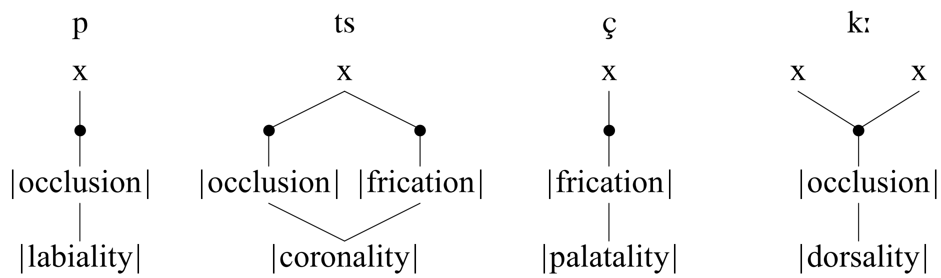
The symbols used for the elements in (2) are those adopted in much DP and GP work. The elements can for the most part be spelled out using the articulatory cover terms in (3), which simply respell the elements in a more descriptive fashion, using terms for what is often assumed to be their key property.

(3) /i/ = |palatality| /e/ = |palatality|+|palatality|
/a/ = |lowness| /o/ = |labiality|+|lowness|
/u/ = |labiality| /y/ = |labiality|+|palatality|

In much of what follows, in part to maintain transparency, I use these ‘spelled-out’ names for the elements, enclosed in vertical slashes. In §5.2.2, however, this over-simple ‘transparency’ is reconsidered, and the facts of melodically driven process inhibition will provide some novel evidence in favour of one particular subtradition of the dependency/government approach to the construction of segmental representations.

The use of spelled-out element names helps illustrate point (ii) above: that the same elements can occur in the make-up of consonants and vowels. This is made explicit in (4), which shows how consonantal ‘place’ is at least partly straightforwardly characterisable using the basic elements illustrated in (2) and (3). Other place elements are also needed here, however, such as |coronality| and |dorsality| – it is to such elements as these that we return in §5.2.2.

(4)



The representations in (4) also show several other points. They make use of other ‘spelled-out’ elements to capture those consonantal properties typically referred to under the heading of ‘manner’ (I put aside here all issues concerned with ‘voicing’ and other laryngeal properties – see Honeybone 2002, 2003 for a discussion of these points connected to the issues relevant to this article), and they illustrate the ‘non-linear’ connections possible between prosody and melody which have been quite widespread in phonological work since the 1980s: the geminate /kː/ illustrates the sharing of all melodic material between two skeletal slots (under one root node ‘•’) and the affricate /ts/ illustrates the opposite kind of relationship.[1]

DP and GP traditions diverge considerably when considering the elements described as |occlusion| and |frication| in (4), but these labels will serve as mnemonics here, which could be rewritten in various ways, according to theoretical preference (thus in most models of DP |occlusion| might be representable as |C| and frication as |V:C|, whereas in standard GP models |occlusion| is straightforwardly **?** and |frication| is **h**). Representations like those

[1] The representations in (4) feature both ‘x’ (= timing slots) and ‘•’ (= root nodes), although for the purposes of this paper only one of these is necessary and the other could arguably be left out.

in (2)–(4) include all the units necessary for the segments considered in this article, with the caveat that some will be reconsidered below.

3. *Processes, environments, inhibition and strength*

Segments are often subject to phonological processes, at least metaphorically – if this were not so there would be nothing to discuss in this article. Much of phonology focuses on the analysis and explanation of these processes, on how they should formally be described and on why they occur in particular sets of phonological environments. A further interesting, but often ill-explored, side of the processes considered in this paper comes to light when we consider where they do *not* occur. It is a phonological commonplace that certain processes have clearly definable 'exceptions', where the structural change does not apply in certain phonological environments; these environments are often described as 'strong' positions, in that their segments have the 'strength' to inhibit the introduction of the process in these environments. This section considers the background to some such cases of process inhibition, to set the scene for §4, where some of the ill-explored aspects of this phenomenon are properly investigated. §3.1 introduces the types of processes which will form the empirical basis for the article, §3.2 considers how these types of processes relate to the phonological environments in which they occur, and §3.3 explains precisely what I mean by 'process inhibition'.

3.1 *The processes of this paper*

I focus here on one 'type' of phonological process. The specific set of processes concerned have frequently been grouped together by theorists and have been described using various terms, e.g. 'lenition' and 'weakening'. They have been rationalised along spontaneous, non-combinatory segmental 'trajectories' – such as those shown below in (5) – in long traditions in both historical and synchronic phonology, including, for example, Lass & Anderson (1975); Lass (1984); Anderson & Ewen (1987); Bauer (1988); Harris (1990, 1994); Kirchner (1998, 2000); Ségéral & Scheer (2001); Honeybone (2001, 2002, 2003). Quite what counts as lenition can vary from theorist to theorist, but most analysts agree that it is insightful to construct such trajectories which segments typically move down in diachronic phonological change, as process is innovated after process, and where the logical conclusion is taken to be elision. The diachronic version of the processes which cause segments to move along these trajectories are often claimed to be 'natural', 'unmarked' types of phonological change.

The 'lenition trajectories' given in (5) thus group together many of the processes which will feature in the coming discussion as sets of numbered 'stages'. The arrows can, in fact, represent either synchronically active, perhaps variable, processes or diachronically discrete phonological 'changes', which are due to the fossilisation of once synchronically active processes. The first trajectory is, in the terminology of Lass & Anderson (1975), a case of 'weakening of closure' lenition, the second is a case of 'sonorisation and opening' lenition, and the third extends the notion from what is often taken to be an essentially consonantal phenomenon, to indicate an equivalent diachronic trajectory from a vocalic starting point.

(5)

0		1		2		3		4
t	→	ts	→	s	→	h	→	Ø
k	→	g	→	ɣ	→	ɰ	→	Ø
y	→	i	→	ə	→	Ø		

It is fair to ask how a segment gets from one stage to the next on a trajectory, but this is not a question which will prove important for our purposes here, and therefore, as promised above, I put it aside. It is highly likely that the set of changes involved in the types of trajectory given in (5) are due to *different* types of phonological pressures and possibilities, and that the unity that has often been perceived among them should not be sought in terms of the segmental structural changes involved, as has often been assumed.[2] There is no space to discuss these issues here, however, and I simply assume that the trajectories group processes insightfully, in line with long traditions; the issues raised here are discussed in Honeybone (2002, to appear) in some detail, however.

3.2 *Processes, environments and positional strength*

Processes are often, but not always, conditioned by the environment in which the affected segment occurs. We can, in fact, distinguish between (i) processes which clearly are truly 'conditioned', i.e. processes which are tied to particular (sets of) environments, *and* are also in some way 'caused' by this environment, as in assimilations and harmony processes, (ii) processes which are 'weakly unconditioned', i.e. processes which are tied to particular (sets of) environments, but which are not 'caused' by that environment, as I argue is the case for lenitions, and (iii) processes which are 'strongly unconditioned', i.e. processes which apply to all occurrences of a segment so that there is no inter-

[2] Indeed, it may well be that true 'voicing' of the kind indicated in the second trajectory in (5) does not belong here, because it is typically due to the acquisition by a segment of properties which come directly from its environment (through spreading, for example), and this is quite different to the other types of process implied in the trajectories in (5).

action between process and environment, as in spontaneous unroundings and raisings. I focus here on processes of type (ii).

The divergence between processes of the three types just mentioned throw into relief the contrast that can be made between a 'process proper' and its environment.[3] In terms of processes of type (ii), such as those illustrated in (5), it is frequently recognised that certain environments are 'strong positions' (see, for example, Ségéral & Scheer 2001). These environments are described as 'strong' because the segments in them are typically not affected by the processes involved, while other occurrences of the segments in question (in other environments) *are* subject to the structural change. We can understand this in the following way: all occurrences of the segments involved are affected by the particular process unless they are given the strength to resist it; this strength can be obtained through the segment being in a strong position. The 'strength' involved here is positional strength – it is by no means the 'inherent' segmental strength that has sometimes been proposed (e.g. by Foley 1977). As we will see, all types of segment can inherit this positional strength, from both prosodic and melodic sources. The following sections of this paper focus in some detail on the question of the definition of some of these strong environments, in order to investigate why it is that certain environments provide the 'strength' for a segment to resist the innovation of a process, while others do not. In considering this, the typographical convention in (6) will prove useful:

(6) Strong environments will be indicated thus: 

Clearly, this is not a theoretical primitive – it simply indicates that there is 'something to explain'. The next few sections seek to provide an explanatory framework for one major part of this explanandum – melodically driven positional strength.

3.3 *Process inhibition*

In processes of type (ii) the effects of segments' environments can be recognised in the patterning of the process. A central claim of this article is that this patterning is not due to the process-promoting effect of any particular set of environments, but is rather due to the process-*inhibiting* effect of strong positions. Process promotion and process inhibition can be seen as two sides of the same coin, however, and if one set of environments can be adequately described, then the other does not need to be defined; thus, if successful, this

[3] In the worn terminology of standard rule-based phonology, this is a difference between the 'structural change' (the 'process proper') and the 'structural description' (its environment).

work on inhibition might entirely obviate the need for the description of promoting environments for the type of processes discussed here.

Some previous work on lenition operates with the idea of lenition promotion, describing 'lenition environments' (or 'weakening environments') rather than 'non-lenition environments' (e.g. Escure 1977; Bauer 1988), or seeking to define 'preferred weakening environments' (e.g. Dressler 1985; Dosuna 1996). However, it seems to be unavoidably the case that one absolute linguistic universal is that linguistic systems change over time – in terms of phonology, new processes are introduced, and segments change. It is arguably pretheoretically surprising, once such process is introduced, that they do not occur across the board to affect all occurrences of a segment (see Ségéral & Scheer 2001). The types of processes discussed here are indeed common. They are arguably simply some of the ways in which segments can change spontaneously in historical phonology. If such processes are indeed so common as to be also almost expected, then the interesting type of phonological environment becomes those which inhibit these processes. This study of such environments is the study of process inhibition. This opens up a prospectively fruitful area of investigation – the consideration of which prosodic and melodic factors prevent the onset of a process, that is, of prosodic and melodic strength-conferring mechanisms.

Certain aspects of process inhibition have been quite well investigated, in fact. Others are poorly understood, or have not previously been discussed. As we shall see, the patterns that prosody and melody impose on the inhibition of the introduction of phonological processes into a phonological system are fundamentally different from each other, and we might therefore expect that they are due to fundamentally different mechanisms. The next section sets out the key generalisations for both prosodic and melodic strength-conferring process inhibition for the types of process described in §3.1, and proposes a novel approach to the understanding of melodically driven process inhibition.

4. *Lenition inhibition: generalisations and proposals*

In this section, I set out the key generalisations that can be made in terms of process inhibition, first in terms of prosody and then in terms of melody. The discussion of prosodically driven inhibition, in §4.1, is not long, because this area has received quite some considerable comment before. §4.2 is more involved, because this area has not previously been much considered. The argumentation in both areas essentially proceeds on the basis of 'theory first, evidence later' – §4 provides the generalisations and hypotheses, which are then tested in §5 through the investigation of a set of attested phonological processes.

4.1 *Prosodic lenition inhibition*

From the considerable amount of work which has investigated the interaction of lenition processes with environmental factors of a prosodic kind (e.g. Escure 1975, 1977; Dressler 1985; Bauer 1988; Dosuna 1996; Harris 1990, 1994, 1997; Ségéral & Scheer 2001), one clear generalisation emerges (among certain substantial disagreements). While such previous work may not have framed its findings or proposals in the terminology of 'process inhibition', it is unproblematically reinterpretable to fit with this perspective, and when this is done, it is clear that the prosodically driven inhibition of lenition processes typically occurs in *initial* positions. The type of initiality involved can vary from process to process, but typically follows an implicational hierarchy of strength along these lines: utterance-initial, word-initial, foot-initial or syllable-initial. Thus (i) utterance-initial is the most inhibitory environment, where segments are typically last affected by a process, (ii) the inhibitory effect of purely syllable-initial environment is only infrequently seen and (iii) the inhibitory effects of the middle two types of environment are quite frequently and variously seen in lenitions.

As these points are not much discussed below, I illustrate them briefly here based on the data from 't-glottalling' (that is, t → ʔ) in two dialects of English which is well known in the lenition literature thanks to work such as Harris & Kaye (1990) and Harris (1994, 1997). The data from dialects (a) and (b) in (7) shows that the foot- and word-initial environments (C2 [(v)__v́] and E [#__]) are strong, because they inhibit the glottalling of /t/ (indicated in bold in the orthographic representation of the relevant words) to [ʔ] in both dialects. The situation concerning syllable-initiality is more complex; the postconsonantal syllable-initial environment in D is inhibitory in both dialects, but the more general syllable-initiality of C1 is only inhibitory in dialect (b). Non-initial environments, such as A [__#] and **A** [__c], are not inhibitory at all.

(7)	A	B	C1	C2	D	E
	*le**t***	*ca**t**kin*	*pre**tt**y*	*pre**t**end*	*af**t**er*	***t**ime*
a.	ʔ	ʔ	ʔ	t	t	t
b.	ʔ	ʔ	t	t	t	t

Various proposals have been made to build these observations into phonological theory. More 'abstract' approaches typically employ some notion of phonological licensing relations to account for the inhibitory potential of these positions, such as the 'licensing inheritance' account of Harris (1994, 1997) or the 'strict CV' use of licensing in Ségéral & Scheer (2001); more phonetically minded work employs articulatory equivalents (as in Kirchner 1998, 2000), or relies on acoustic notions such as the greater perceptual salience of such positions. For the purposes of this paper, I remain non-committal as to the source of phonological explanation for these generalisations, simply recognising pretheoretical generalisations of the type summarised in (8).[4]

(8)	A [__#]	prosodically weak
	B [__c]	prosodically weak
	C1 [v́__(v)]	prosodically relatively weak (has some inhibitory potential)
	C2 [(v)__v́]	prosodically relatively strong (has fair inhibitory potential)
	D [c__]	has inhibitory potential
	E [#__]	prosodically strong (has considerable inhibitory potential)

From these basic generalisations, we can expect initial environments to be strong in at least some of the case studies to come in §5, and hence to inhibit the processes in these environments.

4.2 *Melodic lenition inhibition*

The kind of generalisations discussed here under the heading of 'melodic lenition inhibition' have quite often been noted in passing in phonological analysis, right from its early beginnings in Neogrammarian historical work such as Wilmanns (1911)[5] to contemporary theoretical work such as Borowsky (2001). They have never been pursued in detail, however, nor adequately formalised. As we will see, it is clear that the melodic environment in which a segment finds itself can inhibit the innovation of a process, just as prosodic factors can, but the type of generalisations involved are quite different, as is the mechanism through which the inhibition occurs.

One of the best recognised generalisations in this area, which has been frequently observed, is that geminacy can give a segment strength – processes which affect other occurrences of a segment are often inhibited where it is in gemination (i.e. in a cluster with itself). It has also been widely recognised that 'partial geminacy' (i.e. homorganic nasal–consonant (NC) clusters such as /mb/ and /ŋg/) can also confer lenition-inhibiting strength on the consonant involved. The case studies to come, in §5, will show that this is only a small part of the picture, however – there are cases where segments can receive positional

[4] See Honeybone (2002, to appear) for more serious investigation of attempts to explain prosodic lenition inhibition.

[5] Thanks are due to Tobias Scheer for bringing this volume to my attention, and for discussion of its contents.

strength through being in other types of consonantal clusters, and certain types of consonant–vowel sequences can have the same effect.

The overarching generalisation in terms of melodically driven process inhibition is that ‘sharing gives strength’. By this I mean that melodic process inhibition can be unified as a phenomenon by recognising that it is driven by the sharing of autosegmental material (on the picture sketched in §2, this involves subsegmental elements) among adjacent segments. This has nearly been expressed before in the discussions of the fact that geminacy provides the two halves of a geminate with the ability to resist the innovation of processes, as in the literature on geminate inalterability (e.g. Hayes 1986; Kirchner 1998, 2000). However, these previous approaches to the strength-sharing observation misplace the locus of explanation and miss its widespread generalisability.

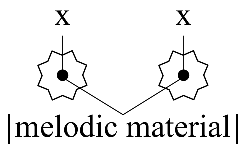
Hayes (1986) accounts for the fact that geminates do not tend to undergo lenition processes by proposing a ‘Linking Constraint’ which relies on the existence of the association lines which link elements to root notes, and hence to skeletal slots. The Linking Constraint is formulated as a constraint on rules and has the effect that rules (such as spirantisation rules) which are formulated to affect singleton segments do not also affect any part of a geminate, even though the structural description of a rule might include the first half of a geminate. As Elmedlaoui (1993) explains, however, such accounts face a substantial problem, because they:

> all share tacitly … the assumption that a given spirantisation rule restricted so as to apply only to geminates should not be less natural than one which is restricted so as to apply to just simplex segments. These two kinds of rule are equally conceivable in view of those proposals, and are tacitly assumed to be equally operative and likely to take place. (Elmedlaoui 1993:134)

But there is a clear asymmetry in terms of these process types. Geminates are always strong when compared to non-geminates. Furthermore, it is false to say that geminacy necessarily inhibits process innovation entirely, as we will see in §5.1.2. And a final problem with simple Linking Constraint approaches is that, while geminacy can indeed provide strength, so can certain other types of clusters and segmental strings.

In the face of all these failings, a superior proposal is that made above, that all cases of melodic process inhibition can be accounted for by the simple assumption that the ‘non-linear’ sharing of underlying autosegmental material can give a segment the positional strength to inhibit the innovation of a process. This can be diagrammed as in (9).

(9)



The ‘strength’ markers in (9) indicate potentially strong positions and predict that melodically driven strength effects will be visible in both these positions, as the strength that is conferred by any aspect of autosegmental sharing may be inherited by the whole segment involved. As we will see in §5, these effects are observable in both the first and second segment in such sequences, and the prosody above the segments is irrelevant – strength generalisations of this type apply across the boundaries of prosodic constituents. It means that, depending on the melodic identity and structure of the segments involved, both environment B [__c] and D [c__] can be strong through melodic means. This is not ‘absolute’ strength, as lenition processes can at times affect even partial and full geminates, but this only occurs when they also affect segments which are not in this kind of melodic configuration.

This approach avoids Elmedlaoui’s problem, as it *predicts* that there should be no lenition processes which only affect geminates (or other types of relevant consonant cluster) but do not affect singletons. It makes falsifiable predictions as to what kind of patterns should be perceivable in melodic process inhibition. For example, in terms of the sharing of ‘place’ elements, it would be falsified if, in a particular lenition process, stops in such clusters as [lk] or [rp] are not affected, but those in [nt] and [ŋk] are, or if the stops in such clusters as [lk] or [rp] are not affected, and those in [lt] and [tr] are. I turn now to consider several attested lenition processes, to discover if such predictions hold true.

5. *Case studies of process inhibition*

This section considers five cases of processes which illustrate the kinds of patterns that occur in process inhibition. All of the processes presented can be characterised as types of lenition, as discussed in §3.1, or as fundamentally comparable types of process. §5.1 considers three relatively ‘straightforward’ cases which involve processes that are clearly of a similar type (they all feature plosive spirantisation as at least part of their description), and which all exemplify some of the (prosodically and melodically) strong environments predicted to exist in §4. §5.2 considers two slightly more complicated cases which exemplify only melodically driven strength, and which involve interactions between adjacent consonants and vowels. The approach outlined in §4.2 predicts that such phenomena as these should exist, as do the dependency/ government models of segmental structure discussed in §2.2, as we shall see, and the discussion of this fact will illustrate the connection between this approach to process inhibition and argumentation concerning issues of segmental structure. The processes discussed in this section thus illustrate aspects of both prosodic and melodic process inhibition, but I focus on the melodic effects; for reasons of space, I shall also restrict the discussion here to the sharing of ‘place’ elements (cases where the sharing of other ‘types’ of elements confers strength are discussed in Honeybone, 2002, 2003, to appear).

5.1 *Straightforward cases of process inhibition*

5.1.1 *Liverpool English synchronic affrico-spirantisation.* The variety of English spoken in Liverpool, England, is notable for several reasons, including the fact that it features consonantal lenition processes, to an extent which is unique among varieties of English. These have been described in quite detailed work on aspects of the variety, such as Knowles (1974), de Lyon (1981), Sangster (1999, 2001) and Honeybone (2001, 2002), although the first fully phonologically informed investigation (Watson, in progress) is not yet complete. Nonetheless, certain generalisations regarding the patterns of process inhibition have frequently been reported, and these form the basis of the discussion here.

Certain important characteristics of the processes are that (i) they affect several of the stops in the system, but are perhaps most salient in /t k/, which are the only segments considered here, (ii) they are synchronically active variable processes, (iii) they involve both affrication and spirantisation and (iv) they can best be understood as involving stages on a trajectory of the type discussed in §3.1. The main realisations of /t/ and /k/ in Liverpool English are given in (10), taken in a slightly simplified form from Honeybone (2001).

(10) 0   1   2
t → tθ͇ → θ
k → kx → χ x ç

The ‘stages’ of the trajectories involved are all synchronically available, but in a phonologically controlled way, such that (i) ‘stage two’ fricatives are frequent in certain environments where affricates and stops may also occur, (ii) in other environments ‘stage one’ affricates are frequent, as are stops, but fricatives are not, and (iii) in certain environments the processes seem to be totally inhibited, such that only stops occur (such environments are, in fact, not discussed here). The segment [θ͇] is a slit non-sibilant coronal fricative (see Hickey 1984; Pandeli *et al.* 1997), and the precise place of the dorsal fricative ([χ x ç]) is determined by that of adjacent vowels (for clarity, this will henceforth be ignored and all dorsal fricative realisations of /k/ will be labelled [x]).

Evidence for the processes is given in (11), which will help to establish the relative strength of particular environments. The evidence, which is derived from the auditory analysis in Honeybone (2001), consists of a list of words from Liverpool English which illustrate the most lenition possible under relatively careful enunciation for the set of environments introduced in (1), with some restriction of focus for environment D.

(11)	A [__#]	*alrigh**t***	[θ̳]	*boo**k***	[x]
	B [__c]	—		*respe**c**t*	[x]
	C1 [v́__(v)]	*ci**t**y*	[θ̳]	*cra**ck**ers*	[x]
	C2 [(v)__v́]	*a**tt**ack*	[tθ̳]	*o**k**ay*	[kx]
	D [c__]				
	[l__]	*adul**t***	[tθ̳]	*wel**c**ome*	[x]
	[N__]	*momen**t***	[tθ̳]	*in**c**onvenience*	[kx]
	E [#__]	***t**aken*	[tθ̳]	***c**ome*	[kx]

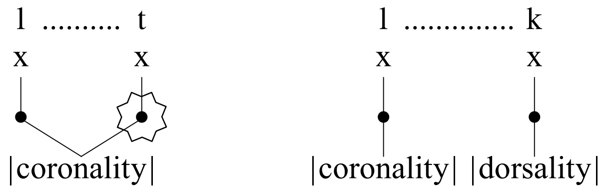
To summarise the prosodic and melodic inhibition of the processes: (i) in A [__#] lenition is possible to a fricative for both /t/ and /k/, (ii) in B [__c] lenition is possible to a fricative for /k/ (the segment /t/ hardly occurs in this environment due to phonotactic constraints), (iii) in C1 [v́__(v)] lenition is possible to a fricative for both /t/ and /k/, whereas (iv) in C2 [(v)__v́] lenition is possible to an affricate for both /t/ and /k/ (lenition to a fricative may also be possible here for /k/), (v) in D [c__] the degree of lenition varies according to the melodic content of ‘c’, as discussed below, and (vi) in E [#__] lenition is possible to an affricate for both /t/ and /k/.

The strong environments which are prosodically defined here seem to be E [#__] and at least in part C2 [(v)__v́], because affricates freely occur here, but fricatives do not. This is what we would expect from the generalisations concerned with prosodic process inhibition that were discussed in §4.1.

The environment D [c__] requires special comment, and it is here that the effect of melodic lenition inhibition come to light. The generalisations are slightly different for the two underlying segments considered here, and can be summarised as follows: (i) in NC clusters (i.e. [N__]) only ‘stage one’ affricates occurs (to the exclusion of fricatives) for both /t/ and /k/, and (ii) the environment [l__] allows ‘stage two’ fricatives for /k/, whereas for /t/ this further stage of lenition in inhibited and ‘stage one’ affricates are the norm. The strong environments which are melodically defined here are thus NC clusters, where place is clearly shared, and one further case of place sharing; this is what we would expect, given the ‘sharing gives strength’ proposal of §4.2, as shown diagrammatically in (12), where only the elements relevant to the discussion are shown, and others (such as those responsible for nasality and laryngeal specification) are omitted.

(12)


More interestingly, the same proposal accounts for the asymmetry in behaviour between /t/ and /k/in the environment [l__], as will be clear from (13), thus, because /lk/ do not share melodic material, the lenition process is not inhibited, unlike /lt/, where the two segments share a place specification.

(13)


While further investigation of the precise phonological patterning of these lenitions is needed, also considering the many other possible melodic combinations, the basic results reported here seem quite firm from auditory observation. Importantly for our purposes, they fit well with the generalisations and proposals made concerning process inhibition in §4.

5.1.2 *Affrico-spirantisation in the High German Consonant Shift.* A rather similar process to that found in contemporary Liverpool English was innovated into (pre-)Old High German. This was a process of affrico-spirantisation, which, once it was lexicalised into the language's lexical representations, left some of the key characteristic features of High German, such as the phonemic affricates /pf/ and /ts/, and correspondences such as those between reference English ***pepp**er*, ***t**ide*, *wa**t**er* and *ma**k**e* (which preserve the West Germanic segments in this regard), and reference High German ***Pf**e**ff**er* [pfɛfɐ], ***Z**eit* [tsaɪt], *Wa**ss**er* [vasɐ] and *ma**ch**en* [maxən]. Discussions of this process, often known as the 'High German Consonant Shift' (henceforth HGCS) abound both in histories of German, such as Braune (1891), Wilmanns (1911), Paul (1916) and Keller (1978), and in recent theoretical discussions, such as Vennemann (1984, 1994), Davis & Iverson (1995) and Davis *et al.* (1999). Little exemplification will be given here for the effects of the processes, as it is easily accessible in these other sources.

The HGCS is no longer a synchronic process, so there is no sociolinguistic variation of the type found in Liverpool English. It was innovated to differing extents in different dialects of High German, however (and some speakers use both reference and non-reference dialects in their speech, of course). In what follows, I typically consider the process in its most 'extreme' form, as it was innovated into southern, Alemannic forms of High German. The prosodic and melodic factors that inhibited the synchronic version of the HGCS are now audible as 'exceptions to the phonological changes' which have been fossilised into varieties' lexical entries, and they are considered below. The processes themselves can be best understood as involving stages on a trajectory of the type discussed in §3.1, as shown in (14), taken in a slightly simplified form from Honeybone (2002).[6]

(14)

0		1		2
p	→	pf	→	f
t	→	ts	→	s
k	→	kx	→	χ x ç

This view of the HGCS as a series of 'stages' on a trajectory follows an established tradition (see, for example, Davis & Iverson 1995). In terms of the environments set out in (1), the main patterns of inhibition in the HGCS can be summarised as follows: (i) there was either a relatively uninhibited process which derived fricatives, involving two stages on the trajectory, (ii) there was some inhibition and the segment went only one stage down the trajectory to become an affricate or (iii) there was total inhibition of the process. While the full details are quite intricate, and not everything can be discussed here, it is clear that both prosodic and melodic factors determined the degree of inhibition. Thus, in the varieties which went on to form the basis for reference High German, (i) stage two fricatives were derived from /p t k/ in environments A [__#] and C [v__v], (ii) the process was partially inhibited, giving stage one affricates, in environment E [#__], (iii) partial inhibition also occurred in environment D [c__], giving affricates, when the consonant

[6] In fact, this presents a rather contentious description of the process, but I lack the space to justify it here, and the contentiousness of certain aspects of the shape of the HGCS does not affect the coming discussion of its patterns of inhibition. In brief, the reflexes of /t/ (symbolised here as 's') were not originally canonical sibilant coronal fricatives (I argue in Honeybone 2002 that they were [θ̠] when the process was first innovated), the stage 2 reflexes are often claimed to have been geminates (in Honeybone 2002, ms, I argue that this need not be assumed), and, as in Liverpool English, the precise place of the dorsal fricative ([χ x ç]) is now determined by that of adjacent vowels, and this place assimilation can here be ignored.

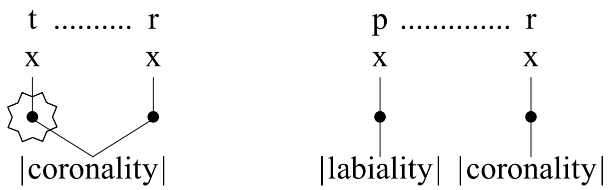
involved was the first half of a geminate or /l m n r/ (although there were no /mt/ clusters, and it was only in /t/ that spirantisation was inhibited following /l/ or /r/, as Wilmanns 1911 explains), (iv) the innovation of the process was entirely inhibited in certain other cases of environment D [c__], including, for /p t k/, the environment [s__], and (v) total inhibition also occurred in one case of environment b [__c], which involved /t/ in the environment [__r].

These patterns of inhibition in the HGCS clearly divide into prosodic and melodic effects. The prosodically defined non-initial environments A [__#] and C [V__V] are weak, whereas the initial environment E [#__] exerted an inhibitory effect, although it was not entirely inhibitory, as it allowed affrication to 'stage one' to occur.

The clearest inhibitory effects in D [c__] and B [__c] are melodic in nature. As this article only deals with the sharing of place elements, I put aside the sC clusters of (iv), which share laryngeal elements, as explained in Honeybone (2002, to appear). Place-sharing effects are common in the HGCS. Thus, in environment D [c__], partial inhibition occurs when a segment is in gemination (that is, when it shares all elements with itself) and in NC clusters, such as /mp/ and /nt/ (hence modern reference German *Dam**pf*** [dampf], *Pflan**z**e* [pflantsə], which correspond with English *dam**p***, *plan**t***) and, although /k/ does not affricate in most varieties, in those which it does, such as High Alemannic, /ŋk/ is practically the only cluster which was completely inhibitory (see Keller 1978). This place-sharing effect in NC clusters is exactly the same as in Liverpool English, as illustrated in (12) above. Essentially the same effect is shown in the other clusters referred to in (iii); thus /lt rt/ are partially inhibitory, giving affricates, whereas /lp rp/ are not (hence modern reference German *Mal**z*** [malts], *Her**z*** [hɛrts], which correspond with English *mal**t***, *hear**t***, contrast with modern reference German *hel**f**en* [hɛlfən], *Dor**f*** [dɔrf], which correspond with English *hel**p***, *thor**p**e*). We can be sure that /r/ was coronal at this point in the history of German, as was /l/, therefore the partially inhibitory effect in /lt rt/ is due to the clusters sharing a specification for place, and the lack of inhibition in /lp rp/ is due the lack of sharing of any element.

Environment B [__c] also shows one instance where the sharing of a place specification endows a stop with the strength to resist the introduction of the process, in /tr/ clusters. In this case the lenition process is completely inhibited through the sharing of coronality between the /t/ and /r/, unlike in clusters such as /pr/, where affrication occurs (hence modern reference German ***t**reu* [trɔʏ], ***T**rog* [troːk], which correspond with English ***t**rue*, ***t**rough*, contrast with modern reference German ***Pf**ropf* [pfrɔpf], ***Pf**riem* [pfriːm], which correspond with modern English *prop* and Old English *preon* "awl, needle" – the initial segments in *Pfropf* and *Pfriem* are affricates rather than fricatives, due to the prosodically inhibitory effect of the word-initial environment). The difference between the two clusters is illustrated in (15).

(15)



As well as the general good fit of these facts with the generalisations concerning prosodic process inhibition discussed in §4, the types of melodically driven lenition inhibition exhibited by the HGCS also fit exactly with the generalisations made above – they are precisely what we would expect from the proposal that element sharing gives segments strength.

5.1.3 *Synchronic Spanish plosive lenition.* Now that the pattern of discussion has been established, the third case of consonantal lenition inhibition can be presented quite quickly. It, too, will illustrate comparable aspects of process inhibition, although the precise details of the patterning will again be slightly different, as we might expect for a separately innovated process. The process dealt with here is one of the best-known cases of synchronic lenition, which, like Liverpool English, involves the spirantisation of underlying plosives, but without the sociolinguistic variation. As is widely explained in descriptions of the phonology of Spanish (e.g. Harris 1969; Macpherson 1975; Harris-Northall 1990; Penny 1991; Wireback 1997), this spirantisation involves realisations such as *cu**b**a* [kuβa] "cask", *ca**d**ena* [kaðena] "chain" and *se**g**uru* [seɣuru] "safe", and the processes can be summarised in (16).[7]

(16)

0		1
b	→	β
d	→	ð
g	→	ɣ

As there is only one 'stage' in this lenition process, the patterns of inhibition can be described quite simply. In terms of the environments set out in

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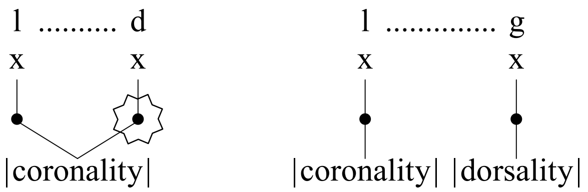
[7] Lavoie (2000, 2001) has investigated the process described here in contemporary Mexican Spanish in substantial detail, using both instrumental acoustic analysis and electropalatography. An important result is that the segments derived in the lenition are actually approximants, i.e. [β̞ ð̞ ɰ̞]; thus the trajectories in (16) may require reconsideration (see Honeybone 2002 for further discussion); this may well be an important discovery, but does not substantially alter the interpretation placed on the phenomenon here; the historically familiar fricative symbols are retained in what follows.

(1), the main patterns of inhibition in this process are: (i) in environment A [__#] lenition occurs freely (although most final consonants had been lost in Spanish before the introduction of this process), (ii) in B [__c] lenition occurs freely, (iii) lenition also occurs in the full intervocalic environment C [v__v], both in C1 [v́__(v)] ([sáβe] “knows”) and C2 [(v)__v́] ([saβér] “to know”), (iv) in environment D [c__] lenition also occurs freely, except after a homorganic nasal, and /d/ does not lenite after /l/, and (v) lenition inhibition can occur in E [#__], but even this environment is not fully inhibitory – while in utterance-initial position no lenition occurs, utterance-medially the same melodic generalisations hold as in D, so lenition can occur across word boundaries (hence *en **B**arcelona* [embarθelona] but *a **B**arcelona* [aβarθelona]).

The only case of prosodic inhibition in these synchronic Spanish lenitions is thus in environment E [#__]; however, this is not really ‘word-initial’, but must either be utterance-initial (the very last vestige of prosodic strength) or it requires melodic inhibitory support, through the sharing of place elements. The melodic inhibitory potential is exhibited in environment D [c__], as we would expect. As in the Liverpool English and HGCS cases, the sharing of place in NC clusters gives the plosive the strength to resist the lenition process. A further case of place sharing, which fits precisely with the proposals and discussion developed above, is shown in the asymmetry in the inhibitory potential between /ld/ clusters and /lg/ clusters. The sharing of place in /ld/ clusters, illustrated in (17), inhibits the lenition process (hence *cal**d**o* “stock” is pronounced [kaldo]), whereas in /lg/, where nothing is shared, /g/ lenites (hence *al**g**o* “something” is pronounced [alɣo]).

(17)


The patterns of process inhibition displayed by these lenitions also fit precisely with the types of generalisations made above, just as in the Liverpool English and HGCS cases. It seems clear that the ‘sharing gives strength’ assumption allows us to account for certain patterns of exceptions in phonological processes which have previously gone unexpressed.

5.2 *Extension: strength sharing and the representation of place*

The proposal that the sharing of underlying autosegmental material among adjacent segments can give a segment the positional strength to inhibit the innovation of a process has been shown to hold up rather well under the testing that was provided by the three case studies discussed in §5.1. The current section extends the coverage of the proposal in two ways. Firstly, in §5.2.1 I recognise that, if the approach is generally applicable to adjacent segments, then we might expect that it can extend to take in place-sharing interactions in consonant–vowel sequences; I present one set of data which shows that this prediction is indeed borne out. Secondly, in §5.2.2 I show that the assumption that the sharing of elements is crucial in providing positional strength gives us a new kind of evidence in argumentation in issues of segmental structure: if melodic strength is conferred by a particular sequence of segments, the prediction is that they must share something. This could prove particularly insightful in cases of sharing among sequences of consonants and vowels, and I consider here one case where this is apparent – this will force us to return to the types of segmental representation assumed in §2.2 and reconsider some of the simplifying 'spelled-out' versions of the names for the privative phonological elements.

5.2.1 *The 'English ʊ change'.* If vowels and consonants are considered to be made up of at least largely the same set of elements, as is frequently claimed in the dependency/government tradition, then it is practically predicted that there will be cases of elemental sharing among consonant–vowel sequences. For example, we saw in §2.2 that what I have here labelled |labiality| is the key, perhaps only, element in vowels such as /u, ʊ/ (see e.g. Anderson & Ewen 1987; Kaye *et al.* 1989; Harris 1994), and |palatality| has been claimed to have the same straightforward relationship with /i, ɪ/. The possibility for sequences of adjacent consonants and vowels to share such elements is clear.

The process discussed in this section will allow us to investigate the idea that element sharing between vowels and consonants can provide positional strength in a similar way to that which we saw in the processes discussed above for consonant–consonant sequences. This is because it is a process which (i) affects vowels, (ii) is analogous to the type of consonantal processes discussed above and (iii) is inhibited melodically through the sharing of elements with an adjacent consonant. The process is what I label here 'the English ʊ change'. This is a process which is well known among English philologists, and which likely occurred around the end of the sixteenth century (see, among many other discussions, Luick 1914–40 and Dobson 1968). It involved the unrounding and lowering/centring of the vowel /ʊ/, leaving a central, schwa-like vowel, which is typically transcribed as /ʌ/, as shown in (18), where, although there may have been some minor intermediate stages, the process is shown as involving one major change.

(18) 0 1

ʊ → ʌ

This process was not innovated into the varieties of English spoken in Northern England; once it was lexicalised in the South, this led to the dialectal correspondence of /ʊ/ with /ʌ/ among varieties of English (hence Northern English ***l**ove* /lʊv/, ***d**uck* /dʊk/ correspond with Southern English /lʌv/, /dʌk/). This process can be seen as analogous to the consonantal processes discussed above, as it was a weakly unconditioned, non-combinatory process which removed structure from the vowel, in a way reminiscent of the processes affecting /y/ in (5); indeed that fact that /ʌ/ is central and mid, and is often phonemicised together with schwa, make this a process which fits well on a 'vocalic lenition' trajectory.

The process was quite general, and, as it affected vowels, none of the potential prosodic inhibitory environments from (1) could play a role in strengthening the vowel to resist the innovation of the process. However, the process was subject to what Harris (1996) calls 'coarse phonological conditioning', which was of a melodic nature.[8] As Dobson explains "M[iddle] E[nglish] *ŭ* was originally the high-back rounded vowel [ʊ]. In Pres[ent Day] E[nglish] in most words it has been unrounded and lowered to [ʌ], but in some words [ʊ] is retained because of labial and other influences" (1968: 585). This quotation indicates the few environments in which the process was inhibited. One crucial aspect of the inhibiting environment is that the preceding segment typically contained the element |labiality|; thus the process occurred in words such as ***cu**t*, ***lo**ve*, ***su**ck*, but not in ***pu**t*, ***fu**ll*, ***bu**tcher*.

These exceptions can be accounted for in the same way as the consonantal interactions in §5.1, as shown in (19). The labial–ʊ sequences can be seen to share the element labelled |labiality| above. Given that the focus here is on such consonant–vowel interactions, which themselves provide further evidence for the fact that the element in /ʊ/ is the same thing as that which provides the labiality in /p/ and /f/, I return to a more standard dependency/government type of representation, relabelling |labiality| as |u| (as it started off in (2)).

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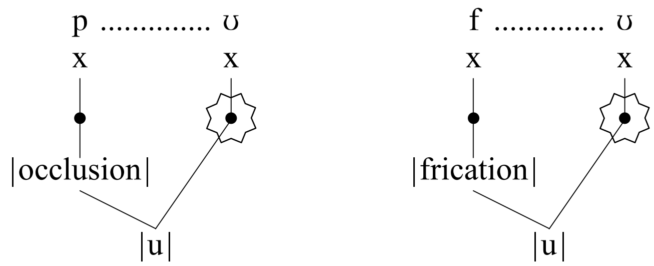
[8] Harris (1996) actually investigates an analysis of the process whereby /ʊ/ is first lost everywhere, and then restored in certain environments (entirely accurately, without hypercorrection in Southern English dialects), but this ʊ > ʌ > ʊ chain seems an unlikely 'diachronic Duke of York gambit' (see Honeybone 2002), which is less parsimonious that the account adopted here, which follows that of Luick (1914–40) and Dobson (1968).

(19)



While a fuller picture of this process would also consider other inhibitory segmental combinations, the sharing of |u|/|labiality| is indisputably the prime inhibiting factor in those words where /ʊ/ is retained. The 'English ʊ change' thus seems to provide us with a case where the sharing of elements between adjacent consonants and vowels serves to inhibit the innovation of a phonological process through melodic means. It also reinforces the identity of |labiality| and |u|.

5.2.2 *Spanish ɣ-elision.* The final case of process inhibition considered here further illustrates the inhibitory effect of element sharing in consonant–vowel sequences. It also allows us to further follow the path of returning to reconsider the nature of the 'spelled-out' element names which were adopted in §2.2. The process in question is an aspect of what we can refer to, following Harris-Northall (1990), as the 'second Spanish consonant shift'. This was a quite general process, which was in part responsible for the introduction of the synchronic lenition processes discussed in §5.1.3. It also involved, among other things, the elision of some of the set of already existing [β ð ɣ], which had themselves been introduced by spirantisation in the 'first Spanish consonant shift'. To save space and avoid confusion, I focus here on the fate of the segment [ɣ] in (20), and only on melodic effects in the inhibition of this process.

(20) 0 1
ɣ → Ø

The phonological conditioning here is somewhat coarse, as it was in §5.2.1, but [ɣ] was mostly lost (hence Vulgar Latin forms such as *digitu* "finger", *legale* "loyal", *magistru* "teacher", which at the time of the shift all had [ɣ], correspond with the Modern Spanish forms *dedo*, *leal*, *maestro*).[9] It is the environments where the elision of [ɣ] is inhibited that are interesting for our purposes here, and Harris-Northall explains that "[ɣ] is maintained before a back vowel … though the low vowel offered less resistance" (Harris-Northall

[9] All data in the discussion of the second Spanish consonant shift is taken from Harris-Northall.

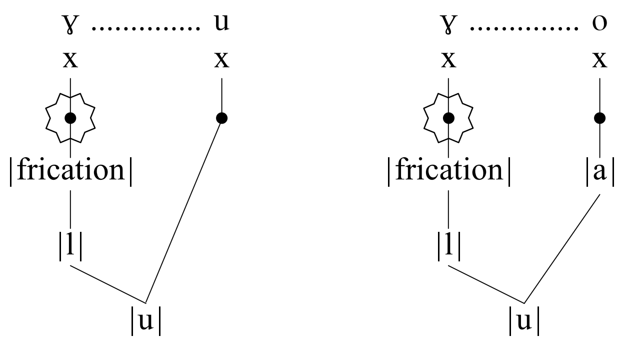
1991:10). This means that, although occasionally [ɣ] did not elide when it occurred directly before /a/, the reliably inhibitory environment is when [ɣ] occurs before /u/ or /o/ (hence Vulgar Latin forms such as ***augustu*** "August" and ***legumen*** "vegetable", which at the time of the shift all had [ɣ], correspond with the Modern Spanish forms ***agosto*** and ***legumbre***, where [ɣ] has been retained – and it could be lost before /a/, as in ***legale*** > ***leal***). The environment which exhibits the greatest inhibitory power is [__ u o], as it consistently gives the consonant the strength to resist the elision process.

We may well wonder how this can be. The representations proposed in (4) claim that the place in velar segments, such as [ɣ], is provided by the element |dorsality|, whereas /u/ only contains |u|/|labiality| and /o/ only |u|/|labiality| and |a|/|lowness|. The use of |dorsality| is commensurate with certain latter-day models of feature geometry and with standard GP practice, where velar place is provided by the element **v** (Kaye *et al.* 1989, 1990) or **@** (Harris 1994), which is very different to the analysis of /u/ and /o/ (which are represented as in DP).

However, one set of representations from the dependency/government tradition in fact predicts precisely the types of interaction described above for the inhibition of ɣ-elision in the history of Spanish. This is the set provided by 'classical', 'narrow' Dependency Phonology, as in Anderson & Ewen (1987). This approach makes use of all three basic vowel elements (|i a u|) in the representation of consonantal place, but also uses |l|, which represents |linguality| (in those segments which are produced with the blade or body of the tongue as an active articulator). It also builds on the Jakobsonian insight concerning the feature [grave] in recognising that labials and velars have something in common – this is taken to be the existence of |u| in their segmental make-up. Consonantal place is thus represented as follows: labials contain just |u|, alveolars contain just |l|, palatals the two elements |l,i|, velars |l,u| and uvulars |l,u,a|.

This kind of representation for place means that labials certainly do contain |u|, as was emphasised in the last section, but it also means that velars contain |u|, too. If this is the case, then representations such as those in (21) can account for the inhibitory power of /u/ and /o/ in the Spanish ɣ-elision process by reducing it to simply another case where the sharing of elemental material can confer positional strength on a segment, in this case [ɣ].

(21)



6. *Conclusions*

This article has attempted to interact with both (i) aspects of 'lenition studies' and (ii) work on the internal structure of phonological segments. I have argued that the patterns of process inhibition in attested lenitions and associated processes require a consideration of both the prosodic and melodic environment in which the affected segment occurs. I have further argued that melodically driven process inhibition can best be understood with an 'element' type approach to segmental structure, such as that provided by the dependency/government tradition and that the patterns of melodic process inhibition can provide a new means by which we can investigate the structure of segments; in considering this, I showed that some of the evidence provided here supports the model of place specification in Anderson & Ewen (1987).

We have seen that both prosodic and melodic factors drive process inhibition, but that the patterns involved in them are very different. Prosodic inhibition relies on asymmetries in prominence and/or licensing, but there are no such positional asymmetries in melodic inhibition, which requires a very different phonological mechanism involving the autosegmental sharing of subsegmental material. The perspectives that this approach opens up for further research are manifold – the proposal that sharing makes segments stronger gives rise to a series of questions and testable predictions.[10] Future work testing these predictions will provide fertile ground for phonology.

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[10] We might wonder, for example, whether the sharing of different types or numbers of elements confers different degrees of strength. Some work, such as Honeybone (2002, 2003, to appear), shows how the proposal can be extended to take in the sharing of non-place elements, but empirical questions remain as to the inhibitory effects of different types of sharing.

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