governor for the empty onset. O4, however, is interpreted as [k] although when the preceding vowel is short, as in (15), it is not interpreted. I suggest that this is because if O4 were not interpreted, there would be an illegal sequence of three adjacent interpreted nuclei. I suggest that in Turkish a maximum of two adjacent nuclei can be interpreted[20]. For this reason O4 in (16) must be interpreted as [k] in order to separate adjacent nuclei.

If we compare this analysis of [meraːki] 'curiosity (3.poss)' with the analysis of the exceptional behaviour of [daː] ~ [dai] 'mountain (3.poss)' discussed in 5.2, we find that exactly the same principle is involved. 'Binarity', a fundamental principle in GP, is manifested here as the illegality of three adjacent filled nuclei. The difference between the two contexts is the outcome of the conflict produced by the addition of a vowel-initial suffix which has no initial onset point. In the one case the onset point fails to be properly governed, in the other case the vowel shortens.

8 Conclusion

In this paper I have shown how the template hypothesis can shed light on the phenomenon of k~ø alternation in Turkish, as well as on some of the exceptional contexts where it does not occur. A stem template, the minimal word, is independent. It is inaccessible to government from outside, i.e. from a dependent suffix template. An exceptional class of vowel-initial suffixes behaves differently because they have an initial onset skeletal point, resembling the French h-aspiré phenomenon. The third exception, which occurs only in loan words with long vowels, is explained as a strategy to avoid a violation of Binarity.

References

Clements, G.N & J. Keyser (1983) *CV Phonology: a Generative Theory of the Syllable.* MIT Press, Cambridge.

Denwood, M.A. (1997) *The role of the element I in Khalkha Mongolian phonology.* PhD thesis SOAS, University of London.

Denwood, M.A. (1998) *A Template for Turkish.* SOAS Working Papers in Linguistics and Phonetics 8: 177–190.

Goh, Y.S. (1996) *The segmental phonology of Beijing Mandarin.* PhD thesis, SOAS, University of London.

Gussmann, E, Kaye, J.K. (1993) *Polish notes from a Dubrovnik cafe. I. The yers.* SOAS Working Papers in Linguistics and Phonetics 3: 427–462.

Harris, J. (1992) *Licensing Inheritance.* UCL Working Papers in Linguistics and Phonetics 4: 359–406.

Kaye, J.D. (1990) *'Coda' Licensing.* Phonology 7: 301–330.

Kaye, J.D. (1993). *Derivations and Interfaces.* SOAS Working Papers in Linguistics and Phonetics 3: 90-126. Also in Durand, J. & Katamba, F. *Frontiers in phonology.* Harlow, Essex, Longman.

Sezer, E. (1981) *The k/ø alternation in Turkish.* in G. N. Clements (ed.) *Harvard Studies in Phonology, Vol. II.* 354-382. Indiana University Linguistics Club.

Sezer, E. (1986) *An Autosegmental Analysis of Compensatory Lengthening in Turkish* in W.L. Wetzels & E. Sezer (eds.) *Studies in Compensatory Lengthening.* Dordrecht, Foris. 227-250.

Yoshida, S. (1992) *Licensing of governing nuclear heads.* Paper presented at Krems Government Phonology Workshop.

[20] Note that some words in their original language have sequences of long and short vowels separated by a (lost) consonant, e.g. Arabic /saːɣat/ [saat] 'hour', /saʔaːdet/ [saadet] 'happiness'. These words do not retain both long and short vowels, which become a sequence of two short vowels when the intervening consonant lenites in Turkish.

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Coronality and: a) the possible relationship between inventory structure and word phonotactics; and b) the possible relationship between form and function.

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1 Introduction

In previous papers and talks (Rubin 2000, 2001a, 2001b, 2002a, 2002b) I have proposed that the headship of the coronal element ([I]) can capture syntagmatic asymmetries involving coronality. These are situations where a coronal is preferred in a certain position in a string (for example in final consonants in right edge clusters in English, in C_1 of C_1C_2 medial clusters in Australian Aboriginal languages, and in both these sites in Finnish). In this paper (no more than a squib really) I would like to show how the headship of the coronal element can do work vertically, or paradigmatically, that is, in capturing why coronals have a priviledged status in consonantal inventories cross-linguistically. Having done this however, I am led to ask questions about why one would wish to capture patterns in inventories and what relationship this might have to the patterns observed in "horizontal strings". Finally, even, worse, I am led to speculate on what the relationship between form and function might be in the causes underlying both these patterns of coronal asymmetry.

In the upcoming section I will outline the 3 asymmetries involving coronality and inventory structure, then move onto modeling it using headedness (in S.3). Once that is in place, the speculation about more general questions will start (in S.4).

2 Three paradigmatic coronal asymmetries

Kingston 1993 analyzes occurrences and co-occurrences of segment types in UPSID inventories. In Rubin 2001b, I showed how these patterns can naturally be seen as evidence of coronal uniqueness. I will recapitulate these findings briefly:

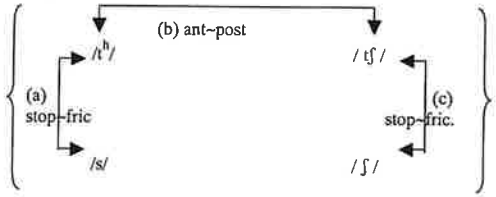
i. Kingston finds that the most common way of increasing inventory size is by adding a specialized articulation to one of the 3 major articulations (which are [labial], [coronal] and [velar] – again these three Places are almost uniformly present in all languages, proving their basicness). Here is where the first asymmetry can be seen: the number of coronal specialized articulations is double that of velar ones, and labial ones are non-existent. Coronal specialized articulations are: dentals, retroflexes and palatals[1]. There is one velar specialized articulation: the uvular stop[2]. Looking more closely, there are in fact two asymmetries here: ***a) there are three possible coronal specialized articulations and only one velar one. b) these coronals occur twice as often as the velar.***

[1] Palatals are assumed to be coronal: they occur only very rarely (statistically less than expected) with the palato-alveolar affricate, suggesting that these two segments are phonetic variants of the same phonological object.

[2] For Kingston, who assumes roughly SPE features grouped in a Feature Geometric way, specialized articulations are made up of the major Place dominating secondary features like {laminal, back, anterior, high...}. For him, *double* articulations are segments where the major Places combine, as in labiovelar /kp/ or /k^w/. The latter segment is an incomplete double articulation, as the labiality does not attain complete closure.

ii. A second Place asymmetry in inventories concerns coronal versus non-coronal fricatives. Kingston shows that coronal fricatives, or sibilants (itself significant as we will see), are included in inventories before the peripheral fricatives /f, x/. But the preference for coronality is not restricted to sibilant fricatives: even the sibilant coronal *affricate* is introduced into inventories in preference to peripheral fricatives. Another odd fact concerning sibilants, is that 4-sibilant inventories are statistically commoner than inventories with one or some sibilants. All this leads Kingston to posit the existence of a "sibilant block", which is selected by inventories before peripheral fricatives. I schematize the development of this block as follows:

(1)



Introducing contrasts in the coronal range
(a): primary coronal contrast: anterior manner contrast [stop~(strident) fricative]
(b): secondary coronal contrast: anterior vs. posterior subplace [stop]
(c): tertiary coronal contrast: posterior manner contrast [stop~fricative]

For this schematization to work, the alveolo-palatal affricate must be considered a species of coronal stop (cf. Kehrein 1997 for 4 pieces of evidence that this is the case), specifically a posterior coronal stop[3]. Kingston shows that affricates pattern with stops in terms of dispreference for voicing; he also shows that /tʃ/ often occurs in inventories without /ʃ/. This strongly tells against the Sageyian contour representation of this affricate as consisting of /t/ and /ʃ/, as such a representation implies that both these segments must be independently present to build the more complex affricate. In Rubin 2001b, I give an alternative representation of affricates which avoids this anomaly. For present purposes, what all this tells us is that: **a) inventory expansion beyond the 3 canonical Places happens through introduction of another coronal stop (previously known as the alveopalatal affricate); b) it then develops in the direction of Manner distinctions, and again the first Manner distinction to be introduced is that of friction (versus occlusion) on the coronals, *followed by* this distinction introduced on the non-coronals.**

iii. One more oddity, which is usually taken for granted, is concealed in the above: this is that coronals have a choice of manner and friction not available to non-coronals. So, only coronals can be sibilant or non-sibilant. Also, while peripherals can be affricated (/kx/, /pf/), affrication among non-coronals is not a common way of expanding inventories; as we saw in 2, though, the coronal affricate is less marked than a peripheral *fricative*. In other words: **coronals routinely have manner and subplace options open to them over and above those available for non-coronals.**

[3] Later, we will see that such an articulatory is merely a temporary taxonomic label. These segments will be given elemental representations, which refer to audio-acoustics rather than articulation.

Thus we have seen in brief three major ways in which coronals have a privileged status in the expansion of inventories, or, in the construction of consonant *paradigms*. Kingston has his own way of deriving these patterns, invoking both a formal and a functional explanation. I will reject these explanations, as there seems to be a logical clash in and between them. This is not to say that the account I put in its place does not also raise questions about the relationship between form and function, and I will tackle just this question in section 4. Firstly, let me recap part of Kingston's account.

One mechanism that Kingston holds responsible for shaping inventories is "adaptive dispersal," a notion he adopts from Ladefoged and Maddieson 1988. To take an example, Kingston maintains that stridency on the posterior coronal stop (*aka* affricate) is chosen as it increases the contrastiveness between this stop and the anterior (alveolar) coronal stop. That is, extra gestures (such as that for stridency) will only be executed to form new segments if the gain of increasing perceptual distance between segments offsets the effort involved in production. "Adaptive dispersal" sounds intuitively like a reasonable explanation for the presence of stridency on the "posterior coronal stop" (as we reclassified it). This would explain why the non-strident posterior coronal stop[4], or palatal stop, which is non-strident is much rarer. But on closer inspection, it is hard to make this notion stick, and it becomes apparent that adaptive dispersal is closely tied up with one's choice of features, as dispersal is calculated in terms of distance between feature bundles[5]. Secondly, even if one accepts the validity of the featural representation of segments, there is still no way of judging how close or distant segments (construed as feature bundles) are. In our example, the posterior coronal stop has the feature specifications: [-anterior, -continuant, +strident]. The anterior coronal stop is: [+ anterior, - continuant, -strident]. The two segments are thus opposite-valued for stridency and anteriority[6]. But then one would predict that the matrix [-anterior, +continuant, +strident] or /ʃ/ would be an even better opposition (as the values for continuancy are also opposite now). The result would be that 2-coronal inventories should optimally include only /t, ʃ/ - which they don't. It all depends which feature one holds constant to effect a comparison. But there is another problem: maintaining that stridency is selected only because it makes affricates differ from anterior coronal stops ignores the fact that stridency is independently preferred for the anterior coronal fricative /s/, when that is the only sibilant added to an inventory[7]. /s/ already differs from /t/ in manner, being [-continuant], so that in a comparison made along the above lines there would be no need for further differentiation in the type of friction. Why then is strident friction preferred here[8]? It seems that "adaptive dispersal" is not so explanatory after all.

This brings us to Kingston's more formalist explanation of inventory shape. We saw earlier the notion of a sibilant block. Kingston generally defines a "contrast block" as a group of segments which exploit "all possible combinations of values for a set of distinctive features." This can lead to – individually – marked feature

[4] See note 1. See also Rubin 2001b for why the palatal stop is the non-strident variant of the palato-alveolar affricate.
[5] Kingston uses what I consider to be highly dubious S.P.E.-type features, cf. Rubin 2001b.
[6] Note that this also assumes a bivalent theory of features, i.e. that the *absence* of a feature, here stridency, is relevant in calculating contrastivity.
[7] After 4-sibilant inventories, the most common type is 1-sibilant inventories containing only /s/.
[8] It occurs to me that the explanation here would lie in a comparison between [+continuant] segments: thus /s/ is strident to further distance it from [-strident] /f/. But my argument is even stronger then: Kingston has shown that /f/ depends on the prior presence of the sibilants. Thus we cannot say that the stridency value of /s/ is given by contrast between a segment which there is no logical necessity to include in an inventory.

combinations being included in inventories. Thus while voiced fricatives are generally marked, English has /z/ because the obstruent inventory is expanded wholesale along the [+/- voice] dimension. Regarding the sibilants, a whole block of 4 is added as we saw, because all combinations of [anterior, continuant] are exploited, while [+strident] is held constant. I call this a formalist explanation because it talks of manipulating discrete categories and values. However, this formalist explanation rides roughshod over Kingston's previous functional explanation: after all the latter predicts that there will be two maximally dispersed segments (in terms of opposition for the values of the features in question), while the former then predicts that all intermediate values between these poles will be filled in, so obscuring the optimal dispersion of these polar opposites.

Due to these contradictions, I propose that inventories develop the way they do for reasons other than "adaptive dispersal" and "contrast blocking". Let's take the developmental trajectory that we looked at before:

(2) /s/ >> /tʃ/ >> /ʃ/ >> /f, x/

This is an implicational hierarchy for sibilants and fricatives: every object on the right presupposes the presence of the object(s) on the left in an inventory[9]. I have argued that adaptive dispersal cannot explain this trajectory. So I will make recourse to an explanation that Kingston also avails himself of for a number of cases: feature enhancement, or integration. However, it will be my only explanatory tool. This theory (Lindblom 1988 etc.) holds that some feature combinations are optimal because two articulations (the theory assumes articulatory features) have the same acoustic effect. For example lip-rounding and tongue raising both lower F2, so that [round] and [high] will be a preferred feature combination (expressible by redundancy rule). To take another case, given in Kingston: palatalized alveolars are twice as common as palatalized velars, as both palatality and the alveolar gesture produce mutually enhancing high-frequency energy. In element theory, the elements are themselves acoustic signatures to begin with, so reference to the original articulatory gesture can be bypassed. Now I can tentatively (and without experimental basis at the moment, though this could be investigated) propose that the stridency of the posterior coronal stop is preferred because strident friction has higher frequency energy than non-strident friction, and this enhances the high-frequency energy (acuteness) which is the signature of all coronal segments. Thus, the problematic reference to other segments can be dispensed with – a segment is well-formed by its own merits, or the merits of its constituent elements.

Integration of elements thus explains why /tʃ/ is selected over /c/, and why /s/ is preferred to /θ/ even where /f/ is not present in an inventory for so-called adaptive contrast. But why is /tʃ/, another coronal stop in addition to /t/, introduced into an inventory even before the peripheral fricatives? Why is /s/ the first fricative to be introduced in an inventory? (Put differently why is the fricative manner contrast introduced on coronal place before any other?) Why, in elaborated[10] inventories, are the retroflex, dental and palatal (all coronal stops) introduced before the labiovelar or uvular stop (all velars)? Integration does not explain this. Strident /f/, consisting of low-energy labiality and high-energy stridency would be an ill-integrated

[9] We do not differentiate between the different peripheral fricatives.

[10] Lindblom & Maddieson (1988)'s term for inventories that expand through inclusion segments with non-basic articulations.

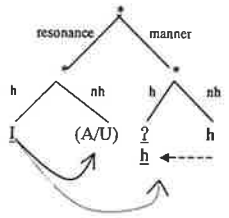
feature/element combination. But a mellow labial fricative would be as well-integrated as a strident sibilant. For this, I offer another tentative functional explanation, one offered speculatively by Stevens & Keyser 1988, which points to a property at the heart of coronality: coronal sounds are, in their words, "especially tied to the fundamental capabilities of the auditory system for processing temporal and spectral aspects of sound." Segments, or feature bundles, which contain coronality are thus going to be selected over ones that don't. Coronality in turn will select other features which enhance it, such as stridency. But even coronals which contain features which do not maximally enhance coronality will be desirable objects, when it comes to incorporating more elaborated segments. Hence the popularity (and indeed the existence) of the retroflex, palatal and dental.

Having seen these patterns of paradigmatic coronal uniqueness, I come to how this can be represented in elemental terms.

3 Modeling these asymmetries with headedness and licensing.

In the last section, we saw that the most desirable Place for a segment to contain was coronality. After this, the manner of a segment is made to "agree" (or, integrate) with this Place. A suitable way of encoding this, it seems to me, is to posit that the coronal element is a head. This concept is meant to give a) the priority of the coronal element in inventory construction, and b) the ability of the coronal element to license other elements, be they Place or Manner[11] elements, in a more potent way than any other element. The following element tree captures this:

(3)



[h = head, nh = nonhead]

The resonance, or Place, phrase is divided into head and nonhead sections, with the coronal element [I] occupying the head position. From there it can license other place elements as dependents, so generating retroflexes or dentals (represented as containing [A] and [U] as dependents respectively). This gives the greater capacity of coronals to sustain subplace contrasts compared to the other canonical Places. Secondly, though, the coronal element can license Manner elements above and beyond the capacity displayed by peripheral elements. To capture this, the Manner phrase is also split into a head and dependent section. This gets that just as the coronal element is superior to peripheral elements, stops (segments containing [ʔ]) are preferred in inventories to fricatives and the latter presuppose the presence of the former. The ontology in (2) makes the existence of manner elements dependent on place elements (in the unmarked scenario; other scenarios can be overlooked for the moment), and captures why coronality can tolerate a greater range of manner contrast than other places: this is because [I], like [A] and [U], licenses the head manner element [ʔ] and the nonhead manner element [h], but unlike [A] and [U], it can

[11] Remember the Manner richness of coronals from 2.ii and .iii.

license the nonhead manner element to "move" (represented by the small leftward-pointing dotted arrow in (2)) into the head position of the manner tree – as a function of its greater licensing power deriving from its headship. This produces the phonological expression (I.h), or /s/. [h] as head in Government Phonology is stridency (cf. Harris 1994). In addition, however, [I] can license *two* heads in the manner phrase of the tree, giving: (I. ʔ. h). This is the representation of /tʃ/, which is best seen phonologically as a strident coronal stop. (The interpretation and licensing of the various subparts of this expression are explained in Rubin 2001b; for the moment the stridency, stopness and coronality of the segment are transparent in the three headed elements comprising it). Without going into the details of how to restrict the generation of element combinations, the important points for the present purpose in the above are: the coronal can license a nonhead to be a head (or appear in head position), and it can license the presence of two heads in a dependent phrase – both marked configurations beyond the licensing capacity of the nonhead peripheral elements. Through headedness we have thus captured the three asymmetries noted in section 2. The advantage of the present approach over other ways of generating phonological expressions in Government Phonology (using Licensing Constraints, e.g. Charette & Goksel 1996, or tiers, e.g Backley & Takahashi 1996) is that this combination of headship and licensing predict that there will be a clear trajectory of segment elaboration, and that not all possible element combinations have the same status – which seems to be borne out by the clear tendencies discovered by Kingston 1993. Having said this, though, our problems are not all over. They could, in fact, be said to have just begun.

4 Speculations on the relationship between form and function.

In this section I shall adopt a more questioning tone. In section 2, I looked at functional explanations for why inventories have the general shapes they do. The only ones which seemed logically consistent were the one holding that segments in which elements are mutually enhancing are optimal, and the one holding that there is an acoustic property of coronality which makes it amenable for human processing and use. In section 3 I then gave representations in terms of headedness, licensing and the geometric structure of segments. The latter seems to capture the former fairly well, but beyond that one might well ask: what need is there for a formal system to encode functional facts? An alternative would be to stick with the more parsimonious elemental representations of segments which encodes their necessary acoustic structure and natural classhood, and leave comments about enhancement of various element combinations to phoneticians.

To be honest, having developed a fancy formal system which, depending on the answer to this question either mimics or explains these facts, I am not quite sure how to answer this charge! But I have some vague ideas along these lines: Stevens & Keyser's comments about the auditory optimality of the coronal element refer to a phonetic ability of humans which need not be categorical in language; the fact, however, that coronals *are* so systematically exploited in segment inventories perhaps shows that the coronal element/feature has received some linguistic confirmation of asymmetry. To run slightly off the rails, perhaps the headedness of [I] (to revert to parochial terms) has become a part of UG, a linguistic datum rather than a fact about non-linguistic human physiology. This would justify the encoding of coronal asymmetry in linguistic terms.

My second defence is a little circular and starts by answering a slightly different question. It is as follows: making [I] head captures very nicely in a way that other phonological theories like Underspecification and Optimality theory cannot (cf. Rubin 2001a, 2001b), how coronals distribute asymmetrically in horizontal strings. This is evidence that humans do at some level encode a phonological asymmetry between coronals and other places. Of course this only justifies making the coronal element head for *syntagmatic* asymmetries. The interesting fact about syntagmatic asymmetries, however, is that they are not functionally driven: in Rubin 2001b I showed that coronal asymmetries can take the form of insisting that a coronal precede a non-coronal, for example in Australian and Finnish medial clusters, or in a contrary pattern found in English, of insisting that a non-coronal always be followed by a coronal (in right edge clusters).

To schematize, some languages permit only TK strings (where T is a coronal obstruent and K a velar one), while others permit only KT strings (the more familiar Indo-European ones, for starters). This means that *functional* explanations in terms of release and recoverability cues (*pace* Hume 2001 or Hamilton 1996, or Jun 1995 etc.) of certain Places in certain contexts are bound to fail. Instead, what's needed is an abstract explanation making recourse to non-phonetic, phonological terms like the licensing of a head element in a certain (prosodically) weak position and the direction of government, and so on. (Exact details are not important, only that a non-phonetic, non-functionalist explanation is needed to capture both the systematic TK and KT pattern). What seems to have happened here (I would speculate, in an attempt to justify the representations posited earlier for inventory generation), is that the optimality of coronal segments, which is originally solely a function of the coronal element's ability to combine well with other elements to form robust segments, has been put to more general effect. In terms of syntagmatic phonetic context, perhaps in some sense TK really is "worse than" KT – but this is overridden by abstract considerations which generate one string and not another or vice versa, according to completely non-phonetic principles. But then think about it: a "phoneme", like /s/ for example, is never pronounced in isolation alongside other phonemes in the phoneme inventory: it is always incorporated into larger phonological structure and pronounced with vowels (stressed or unstressed) and so on. Thus there is never a pure, divorced context where /s/ is robust merely inasmuch as it consists of optimal coronality and attendant optimal stridency. Rather, this segment is always going to appear in a syntagmatic context, in fact in many syntagmatic contexts. Not all of these contexts will be phonetically optimal, (depending on the presence or absence of release and transition cues).

In order to generalize across all possible contexts then, we may further speculate that already from its original generation /s/ is primed to do battle in all and any contexts: and the only way this can happen is if phonology is made to precede phonetics systematically – at the earliest stage. That is, the originally limited functional optimality of the segment (optimal coronal cues enhanced by stridency) is immediately given a linguistic tag so as to be licensed to appear in all and any syntagmatic contexts: headedness is built onto a functional foundation, but ultimately transcends it, throwing away the ladder that enabled it to climb to the privileged position of headedness in the first place. We thus end by saying that our segment paradigm is constructed with a view to insertion into syntagmatic structure: it is thus constructed along the same abstract principles.

This then is my final justification for the idea that phonological expressions encode the geometry and headedness I represented in section 3 right from the

beginning. Whether this argument is justified or spurious awaits further speculation. It has in its favour the advantage of unifying a number of facts about coronality by means of a simple device, headedness. But whether this unification is ultimately justified and necessary, or whether it ultimately obscures different explanations by running them together, I am still undecided.

To put one final speculation into the arena: this concept of the headedness of coronality keeps on doing work. The well-known fact that only coronals partake in consonant harmony would seem to be easily explicable as a result of headship of [I]. Such harmony usually involves the spreading of stridency onto coronals throughout a word (Shaw 1991). The fact that stridency (or [h]) cannot dock onto other consonants is explicable from the fact that no other Place can license stridency; furthermore, heads are linguistically active objects, and so it would seem fitting that only heads can "see each other" across intervening vowels and consonants: this could be modeled by a head projection or a head-transparency condition.

References

Backley P. (1995). 'A tier geometry for vowel systems'. *UCLWPL 7*: 339-436.

Charette M. and Gǫksel A. (1996). 'Licensing constraints and vowel harmony in Turkic languages'. *SOASWPL 6*: 1-25. (and in Kardela and Szymanek(1996): 29-56).

Hall T.A. (1997). *The Phonology of Coronals.* John Benjamins.

Harris J. (1994). *English Sound Structure.* Blackwell, Oxford.

Hamilton P. (1996). *Phonetic constraints and markedness in the phonotactics of Australian Aboriginal languages.* PhD dissertation, University of Toronto.

Hayes, B. (1999). 'Phonetically driven phonology: the role of Optimality Theory and inductive grounding'. in M.Darnell, E. Moravesik, M. Noonan, F.Newmeyer, and K.Wheatly (eds.), *Functionalism and Formalism in Linguistics, i. General Papers* (Amsterdam: John Benjamins), 243-85).

Hume E. (1998). 'The role of perceptibility in consonant/consonant metathesis'. in K. Shahin et al. (eds.), *Proceedings of the West Coast Conference on Formal Linguistics* 17: 293-307.

Jun J. (1995b). 'Place assimilation as the results of conflicting preceptual and acoustic constraints'. *Proceedings of the West Coast Conference of Formal Linguistics* 14: 221-237.

Kehrein (1999). *Phonology without affricates.* Talk given at the 4th HIL conference, Jan. 1999, Leiden University, Holland.

Kingston J. (1993). 'Size, structure and markedness in phonological inventories'. in *Phonological Representations*: 69-129, T. Sherer (ed.), G.L.S.A. Publications, University of Massachusetts.

Lindblom B. and Maddieson I. (1988). 'Phonetic universals in consonant systems'. In L.M. Hyman and C.N. Li (eds.), *Language, speech and mind: Studies in honor of Victoria A. Fromkin.* London, UK: Routledge: 62-78.

Ladefoged P. and Maddieson I. (1996). *The sounds of the world's languages.* Oxford: Blackwell.

Maddieson I. (1984). *Patterns of sounds.* CUP, Cambridge.

Rubin D. (2000). 'The syntax and semantics of coronality: a broad overview of work in progress'. *SOAS Working Papers in Linguistics* 10: 103-137.

Rubin D. (2001a). 'Place-Licensing: opposite orderings are cognitive, not phonetic'. in Hume E., Smith N. & van der Weijer (eds.), *Surface Syllable Structure and Segment Sequencing.* HIL Occasional Papers, Vol.4: 189-209.

Rubin D. (2001b). *The licensing and interpretation of coronality: a new approach.* PhD dissertation, SOAS, London University.

Rubin D. (2002a). 'Licensing consonants in the onset and nucleus'. *SOAS Working Papers in Linguistics* 11: 333-351.

Rubin (2002b). *Coronality, syllable structure and government.* Talk delivered at the 9th International Phonology Meeting, Vienna, November 2002.

Seo M. & Hume E. (2000). 'A comparative OT account of metathesis in Faroese and Lithuanian'. in Hume E., Smith N. and van der Weijer (eds.), *Surface Syllable Structure and Segment Sequencing.* HIL Occasional Papers, Vol.4: 210-229.

Shaw P. (1991) 'Consonant harmony systems: the special status of coronals'. in Paradis & Prunet:125-155.

Steriade D. (1997). Phonetics in Phonology: the case of laryngeal neutralization. Ms. UCLA.

Stevens K. & Keyser J. (1989). 'Primary features and their enhancement in consonants'. *Language 65*, 81-106.

Winters S. (2000). 'VCCV perception: putting place in its place' in Hume E., Smith N., and van der Weijer J. (eds.), *Surface syllable structure and segment sequencing.* HIL Occasional Papers 4, Holland.