Linearization and post-syntactic operations in the Quechua DP[*]

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This paper presents two pieces of evidence for the existence of post-syntactic morphological operations capable of affecting linearization, in line with those hypothesised in the framework of Distributed Morphology. The data concern affix ordering in the DP in three Quechua varieties. First, a case of semantically-vacuous variable affix placement in Cajamarca Quechua is shown to be readily explicable in terms of Local Dislocation. Secondly, Huallaga Quechua and Bolivian Quechua are both shown to have a clitic displacement process which *counterbleeds* a phonological process. This unusual interaction can be explained if the clitic displacement process is an instance of Lowering into a phase which has already undergone a cycle of phonological rules. A series of novel predictions emerges concerning possible and impossible interactions between phonological processes and post-syntactic operations.

Recent research in the framework of Distributed Morphology has argued that the PF wing of the grammar contains several morphological operations capable of altering the output of syntax in various ways (see Halle and Marantz 1993, 1994; Halle 1997; Embick and Noyer 2001, 2006; *inter alia*). In much of this work, it has been assumed that these operations have the power not only to affect the content of feature bundles on terminal nodes, but also to affect the linear order of terminal nodes. Julien (2002), on the other hand, whilst embracing a syntactic model of morphology, proposes that the role of post-syntactic operations should be restricted to that of adjusting the feature content of syntactic heads. In particular, she assumes that 'the surface order of morphemes is a direct consequence of syntax' (p. 4), adopting the Linear Correspondence Axiom of Kayne (1994) as the sole enforcer of linearization, and thus abandons all morpheme-permuting post-syntactic operations. In this paper, I present two pieces of data concerning affix ordering in the DP of three Quechua languages, arguing that they cannot be accounted for unless morpheme-permuting operations are invoked. I show that in each case the locality constraints on these operations depend upon the stage of the PF derivation at which they take place (whether before or after vocabulary insertion), precisely as proposed in recent work by Arregi and Nevins (2008) and Embick (2007b). I also identify some previously unnoticed predictions of this model concerning the potential interaction of morpheme-permuting rules and phonological rules.

Section 1 introduces the key theoretical assumptions underlying the version of Distributed Morphology adopted here. Section 2 outlines the basic facts of the morphosyntax of Quechua DPs, making a novel proposal regarding possible configurations resulting from full roll-up movement. Against this background, Section 3 describes a case of semantically-vacuous variable affix placement (henceforth SVAP) from the Quechua of Cajamarca. The properties of this phenomenon are shown to fall out naturally if it is assumed to be an instance of Local Dislocation, an operation which takes place after vocabulary insertion and which is therefore constrained by linear adjacency. Section 4 examines a process which displaces a clitic *-lla* in Huallaga and Bolivian Quechua. This process counterbleeds the phonological rule of *ni-* insertion, requiring that *-lla* displacement be ordered *after* this phonological rule. This interaction seems to pose an architectural paradox for the Y-model of classic DM, in which syntax precedes morphology and morphology precedes phonology. However, I shall suggest that recent adaptations of DM to accommodate phase-based spell-out (see Marantz 2001, 2007; Embick 2008; Marvin 2002; Newell 2008) allow for a solution in terms of a Lowering operation moving *-lla* into an already spelled-out phase. The locality conditions on Lowering differ in crucial ways from those of Local Dislocation, since Lowering occurs before vocabulary insertion. Section 5 concludes with a short discussion of the theoretical implications of the data discussed.
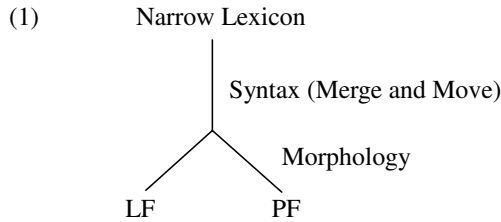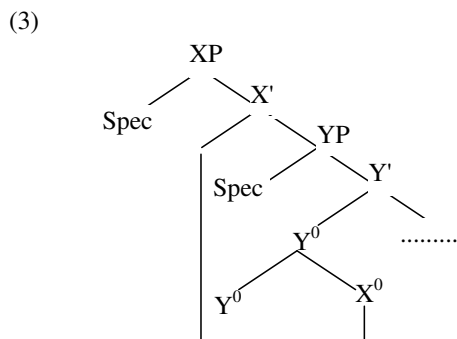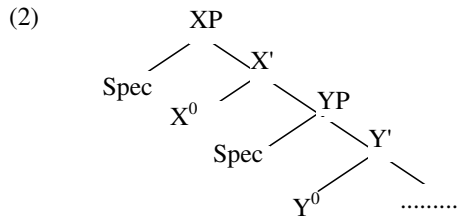
1 THE FRAMEWORK: DISTRIBUTED MORPHOLOGY

The architecture of the grammar assumed in Distributed Morphology is illustrated in (1).

(1)   Narrow Lexicon

                Syntax (Merge and Move)

                     Morphology

       LF   PF

Crucially, the 'Narrow Lexicon' in this model consists only of a list of roots and functional heads; it is not the site of any generative processes specific to building words (as it is in lexicalist theories such Lexical Phonology and Morphology (Kiparsky 1982)). Rather, the syntax is the only generative component of the grammar, and it is solely responsible for building both word and phrase structure. This claim, a major focus of current research in the framework, is referred to as the Single Engine Hypothesis (Marantz 2001; Arad 2003). Another important feature of the model is that the syntax manipulates only bundles of morphosyntactic features, which have no phonological content. The phonological matrices of morphemes, referred to as Vocabulary Items (VIs), are inserted during the PF derivation, and are not present at all in the Narrow Syntax. This aspect of the theory is known as Late Insertion. This means that DM is a piece-based, realisational and separationist model of morphology — words are decomposed into meaningful parts, surface morphemes are realisations of abstract features, and these features are considered as separate entities from the surface forms that realise them.
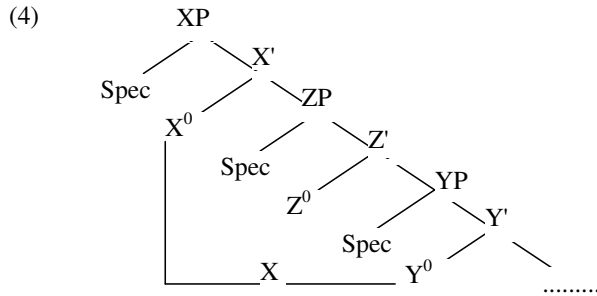
    As well as vocabulary insertion, the PF wing of the grammar contains various post-syntactic operations. Some of these apply before vocabulary insertion (henceforth VI-insertion) — these include Impoverishment, which deletes features on functional heads according to language-particular requirements (see Halle 1997; Noyer 1992; Bonet 1991),[1] and Fusion, which takes two structurally adjacent terminal nodes and fuses them into one, again on a language-specific basis. I forgo more detailed discussion of Fusion and Impoverishment since they will not be of relevance here. More important to this discussion is Lowering, which also takes place before VI-insertion and which is capable of affecting the linear order of morphemes.[2] The locality constraints on Lowering are determined by syntactic structure. Lowering relates two terminal nodes, X^0 and Y^0, where YP is the complement of X^0, and adjoins X^0 to Y^0 as shown in (2) and (3).

(2)

(3)

However, if a third head Z^0 intervenes between X^0 and Y^0 (i.e. if Z^0 c-commands Y^0 but does not c-command X^0), then Lowering cannot relate X^0 and Y^0 in this way, as shown in (4). This effectively means that Lowering has similar properties to Head Movement, except that it applies in the opposite direction.

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1   It has been suggested that marked feature values are replaced by unmarked feature values rather than being deleted when affected by Impoverishment. See in particular Noyer (1992) for details.

2   Although it need not in some implementations: some have proposed string-vacuous applications of Lowering which result in the rebracketing of the structure output by syntax. See Embick and Noyer (2006).

(4)

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                    XP
                   /\
               Spec  X'
                 / \  \
              X⁰    \   ZP
              /      \  / \
             |     Spec   Z'
             |       \   /  \
             |      Z⁰    \   YP
             |      /      \  / \
             |     |    Spec   Y'
             |_____X_____Y⁰   \
                                  .........
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After these pre-VI-insertion operations comes VI-insertion itself. This proceeds cyclically from the most deeply embedded terminal node outwards (this will typically mean from the lexical root outwards). It is during this process that the linear order of nodes in the tree, both of phrases and of individual morphemes, is determined. Much work in DM (including Embick 2008, 2007b; Arregi and Nevins 2008) assumes that all of linearization is determined at PF, and that syntax contains information only about hierarchical structure. Individual affixes are permitted to stipulate whether they are prefixes or suffixes, for example, and the same goes for all nodes in the tree. Whilst this work implicitly denies the Antisymmetric approach to linearization of Kayne (1994), it is not inherently incompatible with it. One could easily imagine a theory in which the PF algorithm which determines the linear order of phrases and morphemes takes asymmetric c-command as its criterion for determining relations of linear precedence, rather than allowing each element to stipulate its directionality. Such a revision of the theory would be perfectly within the spirit of DM, in which PF operations are already assumed to be able to 'see' syntactic structures, and may indeed turn out to be desirable. This is certainly true for the linearization of phrases if recent work by Biberauer, Holmberg and Roberts (2007; 2009) and Sheehan (Submitted) is correct in arguing that the asymmetry in the distribution of disharmonic word-orders known as the Final-over-Final-Constraint (FOFC) is best understood from the perspective of a Kayneian approach to linearization. Similar considerations apply to the linearization of morphemes if FOFC holds in morphology, as I argue in Myler (forthcoming). I shall therefore assume that linearization is performed at PF in accordance with the LCA in the first instance.

After VI insertion and the preliminary linearization of the output of syntax, there is a further post-syntactic operation known as Local Dislocation.[3] Since this operation takes place after preliminary linearization, it is constrained by linear adjacency rather than by structural adjacency. To illustrate, assume that terminal nodes W, X, Y and Z have been linearized as shown here (where 'X*Y' means 'X precedes Y'):

(5)   W*X*Y*Z

Local Dislocation can replace the linear relation * between two nodes, exchanging it for a relationship of adjunction. Hence, if a Local Dislocation operation were to apply to W and X, the result would be as follows:

(6)   X+W*Y*Z

It is important to note that Local Dislocation can apply only under strict linear adjacency. Hence, it could not apply to (5) to relate W and Z, yielding (7):

(7)   Z+W*X*Y

Embick (2007b) makes two interesting conjectures concerning the nature of Local Dislocation (p. 326; his (35c)):

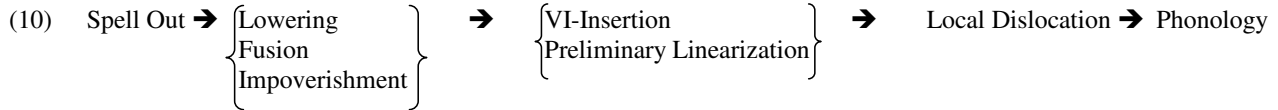(8)   Consistency + Typing: All cases of LD are typed and restricted to phase boundaries.

By 'typed' Embick means that they can only relate elements of the same structural level — so, no post-syntactic operation can relate a sub-element of a complex head with an element from outside that complex head, for instance. The idea that LD is restricted to occur only across phase boundaries is related to the conceptual desideratum that linearization statements should not contradict each other. Take the two schematic representations below, where '(' represents a phase boundary (based on Embick 2007b: 325; his (33)):

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3   There is also an operation which takes place during VI-insertion, namely, Fission. When a terminal node is marked for Fission, any features not specified in the first VI to be inserted into it split off into a second feature bundle, into which another VI can be inserted. This process can repeat itself until all features have been spelled out. See especially Halle 1997 for details. Fission has mainly been invoked in situations where person and number features from the same phi-feature bundle are spelled out by separate VIs. However, it has been criticised on the grounds that it offers no account of the robust typological generalisation that person agreement is always realised nearer to the left edge of a word and number agreement towards the right edge, when these are spelled out separately. See Harbour (2008) and Trommer (2002) for details and alternatives to Fission.

(9) a. (X*(Y*Z
    b. (W*(X*Y

Now, assume there is an LD operation which affects X and Y. The consistency condition would allow this to apply in (9a), but not in (9b). This is because in (9b) there is a statement 'W*X' which would be contradicted by the fact that X has adjoined to Y. No such problem arises if X and Y are related in (9a), for in this case Y will maintain its relationship with Z 'because X has adjoined to Y, and adjunction does not disrupt relations in this fashion' (Embick 2007b: 325). This is an interesting prediction, and as Embick notes 'it remains to be seen whether a restriction of this type makes the correct prediction in a phase-based model' (2007b: 326). We shall return to this issue later.

Once all Local Dislocation operations are complete, the structure is submitted to the phonological component. This completes our description of the PF derivation as conceived of in Distributed Morphology. The order of operations is summarised here in (10):

(10)   Spell Out ➔ { Lowering   ➔   { VI-Insertion   ➔   Local Dislocation ➔ Phonology
                     Fusion   Preliminary Linearization }
                     Impoverishment }

We now proceed to a brief description of the basic facts of the morphosyntax of DPs in Quechua.

2   A SKETCH OF THE QUECHUA DP

Quechua is a family of languages spoken in the Andean and Pacific regions of Peru, Ecuador, and Bolivia, parts of Colombia, northern Chile and northern Argentina. Estimates of the total number of speakers vary from 8 million to 10 million (see Adelaar 2004: 168 for more discussion of these estimates). Whilst the many different varieties are often called 'dialects', we are well justified in calling them independent languages if the criterion of mutual intelligibility is used. As Adelaar (2004: 168) puts it, 'Speakers of different Quechua dialects often have a difficult time understanding each other. If the dialects are not closely related, there may be no mutual comprehension at all.' The three varieties under discussion in this paper are Cajamarca,[4] a variety spoken in rural communities surrounding the northern Peruvian city of Cajamarca (Quesada 1976; Coombs Lynch et al. 2003); Huallaga, a central Peruvian variety spoken in the Huánuco province (Weber 1976, 1983, 1989); and the Bolivian varieties described in Lastra (1968) and Bills et al. (1969).[5] Torero (1964) classified Cajamarca in his group IIA and Bolivian in the IIC group. This suggests that these two dialects are more closely related to one another than either is to Huallaga, which belongs to Torero's group I, though in fact Adelaar notes (2004: 186) that the IIA dialects appear to 'occupy an intermediate position' between group I and the rest of group II. In any case, none of these varieties is mutually intelligible with any of the other two. We shall nonetheless see that they exhibit many similarities in the morphosyntax of their DPs.

All three of these varieties exhibit the default order demonstrative > numeral > adjective > noun in the DP. This is exemplified below for Cajamarca Quechua[6] (Quesada 1976: 80).

(11)   kay kimsa yuraq wasi-kuna   (Cajamarca)
        this three white house-plural
        'These three white houses'

Note that there is no agreement of the demonstrative, numeral or adjective with the noun. However, the noun itself shows agreement for person and (optionally) number with a possessor DP:

(12)   warmi-kuna-pa   mishu-n-llapa-kuna[7]   (Cajamarca)
        woman-plural-gen   cat-3POSS-pplu-plural
        'the women's cats'

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4   Henceforth I shall refer to all Quechua varieties simply by the name of the region in which they are spoken, or by the name given for them in my sources (as in the case of Huallaga).

5   By no means am I claiming that Quechua within Bolivia is homogeneous. My comments apply to the varieties described in the works cited, which are the same in the aspects relevant to this paper.

6   Although in fact other orders are also possible, this one is the default. Quesada (1976: 80) notes that, under the influence of Spanish, it is becoming more and more common for the adjective to follow the noun in Cajamarca. I abstract away from this in the discussion to follow.

7   Glossing conventions are as follows: 1o=1st person object, 2POSS=2nd person possessive, 3s=3rd person subject, Ac=accusative case, CAUS=causative, CONT=continuous aspect, def=definiteness, Ev1st=1st hand information, FUT=future tense, gen=genitive, IMP=imperative, impf=imperfective aspect, PAST=past tense, plural=nominal plural, pplu=plurality on person markers, sub=subordinator, TOP=topic.

Quechua languages mark structural and inherent case-related notions via a range of phrasal suffixes (Cajamarca has eleven such suffixes, for instance; in some varieties some of the phonologically heavier markers have the status of separate phonological words, and are more aptly called post-positions):

(13)   kay kimsa yuraq   wasi-y-llapa-kuna-pi
        this three white   house-1POSS-pplu-plural-in
        'in these three white houses of ours'

Cajamarca and Bolivian appear to have nothing comparable to a definite article. Instead, bare nouns are interpreted as definite or indefinite depending on context. However, Weber (1989: 273) notes that Huallaga, in common with many Quechua I varieties, has a suffix *-kaq* which 'makes the substantive it follows definite, corresponding roughly to a definite article'. Note the contrast between these two examples (Weber 1989: 273, his (1105a and b)):

(14)   a. hatun-ta muna-:   (Huallaga)
           big-Ac   want-1s
           'I want a/the big one'

        b. hatun-kaq-ta muna-:
           big-def-Ac   want-1s
           'I want *the* big one'

So, while bare nouns can still be interpreted as either definite or indefinite in Huallaga, nouns with *-kaq* suffixed have only a definite interpretation. Etymologically this suffix is a nominalized form of the verb *kay* 'to be', literally meaning 'one that is'. Weber (1989: 271-2) notes that *-kaq*, as well as being a suffix, can also appear as a separate word (where the criteria for wordhood are phonological ones such as whether it shifts stress or is contracted with preceding morphemes). An example is the following (p. 271, Weber's (1100)):

(15)   ...hama-rpa-yka-n llapan chay-chaw ka-q   runa-kuna-qa   (Huallaga)
        sit-pplu-impf-3s all   that-in   be-sub   man-plural-TOP
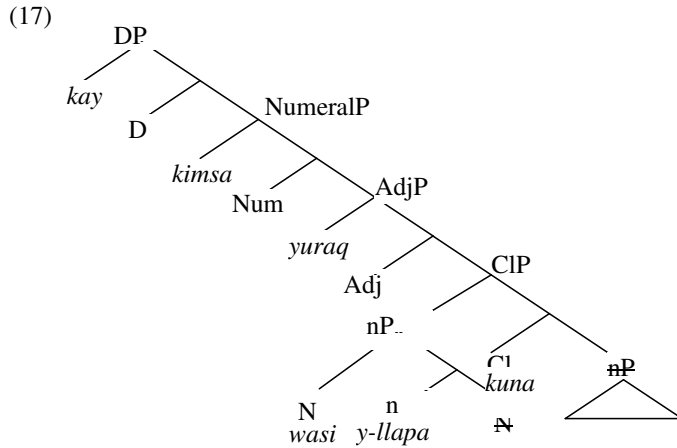   '...all the men that are there are sitting'

It seems reasonable to claim that these instances of *-kaq* as a separate word are simply genuine cases of nominalized *kay*, whereas cases where *-kaq* is a suffix are instances of a true definite article, realising the D head. Examples such as (16) may seem to challenge this conclusion if we take them as showing that '*-kaq* (as a suffix) may follow as well as precede a case marker' (Weber 1989: 271), since if *-kaq* were a D head we would expect all case markers (realisations of P) to be peripheral to it, whereas here the marker *-pita* appears inside *-kaq*. (The accusative marker appears outside of *-kaq*, as expected):

(16)   Qeru-pita-kaq-ta   rupa-chi-shun   (Huallaga)
        wood-from-def-Ac   burn-CAUS-1incl.IMP
        'Let's burn those which are (made) of wood'

However, it is clear from examples like (14) that Quechua is unlike English in allowing null N's in phrases such as 'the big *(one)'. Hence, the word *qeru-pita-kaq-ta* here might be better glossed 'wood-from-Ø-def-Ac', where 'wood-from' is a PP adjunct to the noun phrase headed by 'Ø'. Since *-kaq* and the accusative marker *-ta* are affixes, they form a phonological word with the PP adjunct, since a zero-noun cannot support them. I conclude that examples such as (16) pose no problem for the hypothesis that *-kaq* is a realisation of the D head.

     Yet this conclusion leads to an apparent problem for the Kayneian approach to morphosyntactic linearization which I adopt here. We have already seen that the demonstrative, numeral and adjective precede the noun in that order in Quechua. In Cinque's (2005) approach to Universal 20, such languages are derived by assuming no movement of NP or any phrase containing it. But if NP is in its base position, how are we to explain the fact that all of the affixes in the Quechua DP are suffixal? In the case of Bolivian and Cajamarca, where there is no suffixal article, this problem arguably doesn't arise because the only relevant suffixes are the nominal plural marker *-kuna* and the possessor agreement markers (the case markers are P elements, and are thus external to the DP anyway). These can be argued to correspond to functional heads lower than those introducing the demonstrative, numeral and adjective. We can then postulate partial roll-up movement to derive the correct surface order, as illustrated below for Cajamarca (ClP is 'Classifier Phrase', assumed to host interpretable number and noun classifiers in languages that have them; I assume that in Cajamarca little-n is the head that probes the phi-features of the possessor[8,9]):

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8   Quechua varieties differ in this respect, as we shall see.

(17)

kay kimsa yuraq wasi-y-llapa-kuna
this three   white house-1POSS-pplu-plural
'these three white houses of ours'

This will not work for Huallaga, however, where *-kaq* is the suffixal definite article. Postulating partial roll-up here will produce the right ordering for the demonstrative, numeral and adjective, and for the possessor agreement and nominal plural suffixes, but leads us to expect *-kaq* to surface just after the demonstrative, which we can see from (14) and (16) is incorrect. On the other hand, it does not seem that a full roll-up derivation will work either. In Cinque (2005), this sort of derivation is held to be responsible for languages with the order noun > adjective > numeral > demonstrative, exactly the opposite of the order we want for Quechua. In addition, this will not even solve the problem posed by *-kaq*, at least on the version of DP structure assumed by Cinque. Cinque assumes that every phrase on the DP projection line has an Agr projection above it, and that it is via the specifier of these Agr positions that roll-up movement proceeds (2005: 3). If we apply this to Huallaga, we predict that *-kaq* should be suffixed not to the noun, but rather to the demonstrative, in absolute final position, with the whole DP being ordered noun-possessor agreement-plural > adjective > numeral > demonstrative-*kaq*.

There is an additional issue which arises for all of the varieties discussed. This is that, according to the structure in (17), the DP in Quechua is head-initial. When we consider the fact that the case markers are post-positional, we are then forced to the conclusion that Quechua violates the Final-over-Final-Constraint (Biberauer, Holmberg and Roberts 2007, 2009) by having head-initial DPs dominated by head-final PPs.[10] Since FOFC seems otherwise robust in this domain (see, for instance, the examples from Finnish cited in Biberauer, Holmberg and Roberts 2009:4), we should seek a way to avoid this claim.

I propose to solve these difficulties as follows. Rather than assuming the Agr projections of Cinque's representations, let us instead allow each functional head to have multiple specifiers. What this will mean is that in a language with full roll-up, each head will have a specifier accommodating the moved structure and potentially another specifier accommodating what is normally externally merged there (e.g. the demonstrative in the case of D). Now, on the assumption that Move is really just internal Merge, there is no automatic ordering to the operations of merging a head's externally merged specifier and merging a copy of the moved structure. Let us assume then that languages with roll-up can choose whether to merge moved elements before or after the externally merged specifier.[11] As far as I have been able to work out, this idea does not permit any of the unattested orders of demonstrative, numeral and adjective which Cinque's account excludes, although for space reasons I cannot show this in detail here.

We can now solve both the problem of the position of *-kaq* and of the FOFC violation produced by the partial roll-up analysis by assuming that all three varieties (and, presumably, all Quechua varieties) have full roll-up movement, with

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9   DM analyses usually assume that lexical roots are acategorical, gaining a category via merger with a category-giving head (see references cited throughout). I have abstracted away from this in the trees given here.

10   This will also apply to Huallaga if we attempt to solve the *-kaq* problem by claiming that it becomes a suffix via successive-cyclic Lowering to the head noun. This is because Lowering is a morphological operation, and its application would not change the fact that the Quechua DP is head-initial in the syntax.

11   More precisely, individual functional heads will independently specify the order of their specifiers (in accordance with what has become known as the Borer-Chomsky Conjecture), although we can assume that in this as in other things the functional heads within a particular language will tend to show a high degree of harmony. See Holmberg and Roberts (to appear) and Biberauer, Holmberg and Roberts (2009) for a third-factor account of harmony in general.

external Merge following internal Merge at each step, giving the appearance of tucking in. This means that the Quechua DP is now syntactically head-final, so that there is no FOFC violation when a head-final PP dominates a DP. Plus, as we can see from the tree in (18), the expected order of elements is now demonstrative > numeral > adjective > N-possessor and plural suffixes > D. -*kaq* will therefore surface in the correct position.

(18)

This is the analysis of the Quechua DP that I will assume for the remainder of this paper. It remains to point out a small difference between Bolivian Quechua and the other two varieties concerning the position of possessor agreement. In both Huallaga and Cajamarca, the possessor agreement suffixes precede the nominal plural morpheme; in Bolivian, they follow it.

(19)   wasi-n-llapa-kuna-pi   (Cajamarca)
        house-3POSS-pplu-plural-in
        'in their houses'
(20)   wasi-n-kuna-chaw   (Huallaga)
        house-3POSS-plural-in
        'in his/their houses'
(21)   wasi-kuna-n-ku-pi   (Bolivian)
        house-plural-3POSS-pplu-in
        'in their houses'

I take it that this merely reflects variability in which functional head hosts uninterpretable phi-features in the Quechua DP. Presumably this head is n^0 in Cajamarca and Huallaga, but Adj^0 in Bolivian, producing the varying position of the agreement morphology with respect to the plural morpheme (a manifestation of Cl^0). That the identity of this head should vary in this way should hardly surprise us, given Julien's (2002) findings for agreement in the clause. On the basis of a survey of the clausal morphology of 530 languages, Julien concludes that agreement morphemes 'are found in so many different positions cross-linguistically that it seems impossible to relate subject agreement or object agreement to one particular syntactic head'. With this in mind, it would be surprising if DP-internal agreement markers failed to show variable distribution (see *inter alia* Cinque 2003 and Bernstein 2001 for discussion of further parallels between nominals and clauses).

This completes our sketch of the Quechua DP. We now proceed to our first piece of evidence for morpheme-permuting operations: a case of semantically-vacuous variable affix placement in Cajamarca.

3   SVAP IN CAJAMARCA QUECHUA[12]

The Quechua of Cajamarca is spoken in rural communities surrounding the northern Peruvian city of Cajamarca, particularly in the districts of Porcón and Chetilla. Ethnologue reports that it has 30,000 speakers, although in many communities all but the most elderly speakers are now bilingual in Spanish and in many cases the language is no longer being passed on to children. My sources are a beginner's course book on the language used by the Quechua Academy in the city of Cajamarca (Coombs Lynch et al. 2003), a grammar of the language (Quesada 1976), several folk tales written by

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12   I discuss the implications of the data presented in this section for different theories of morphology in Myler (2009).

native speakers, and my own field notes.

This dialect marks plurality of person morphemes on both nouns and verbs via a suffix, *-llapa*. The following examples show its effect on both a noun and a verb:

(22)   a. mishu-n
          cat-3POSS
          'his cat'

        b. mishu-n-llapa
          cat-3POSS-pplu
          'their cat'

(23)   a. rika-nki
          see-2s
          'you (sg) see'

        b. rika-nki-llapa
          see-2s-pplu
          'you (pl) see'

Focussing on nouns, nominal plurality is marked via a suffix *-kuna*, as we have seen:

(24)   a. mishu
          'cat'

        b. mishu-kuna
          cat-plural
          'cats'

Now, the sources on this dialect contradict each other with regard to the placement of *-kuna* relative to *-llapa*. Quesada (1976: 89) claims that *-llapa* follows *-kuna*, whereas Coombs Lynch et al.'s (2003) course book cites only examples where *-llapa* precedes *-kuna*. My own fieldwork suggests to me that for many speakers both orders are in fact possible, such that both of the following examples are grammatical translations of 'their cats':

(25)   a. mishu-n-llapa-kuna
          cat-3POSS-pplu-plural

        b. mishu-n-kuna-llapa
          cat-3POSS-plural-pplu
          'their cats'

There is a further quirk concerning the case markers. When these appear with *-llapa*, they generally follow it, as shown here:

(26)   wasi-n-llapa-pi
        house-3POSS-pplu-in
        'in their house'

This is the only order reported in Quesada (1976) and Coombs Lynch et al. (2003), and indeed seems to be by far the most common one, so much so that I assumed it was the only one possible for virtually the whole time I was learning the language. Shortly before the end of my first visit to Peru, however, I came across the following word in a Cajamarca folktale called *kimsa yanasakuna*, 'The Three Friends':

(27)   manchay-ni[13]-n-pi-llapa
        fear-NI-3POSS-in-pplu
        'in their fear'

It seems that certain case markers, including at least *-pi* and some others,[14] can appear both before or after *-llapa*.

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13   The suffix *ni-* is an epenthetic CV syllable, which will be discussed in Section 4.

However, as these examples show, these case markers must follow *-kuna* whenever it appears:

(28)   a. wasi-kuna-pi
           house-plural-in
           'in the houses'
        b. *wasi-pi-kuna

Nor can the postpositions appear before combinations of *-llapa* and *-kuna*; they must follow *-kuna* here too:

(29)   a. wasi-n-llapa-kuna-pi
           house-3POSS-pplu-plural-in
           'in their houses'

        b. *wasi-n-pi-llapa-kuna
           house-3POSS-in-pplu-plural

Interestingly, it is possible to show that it really is the presence of the phonological form *-kuna* itself that blocks the inversion, rather than the presence of a morphosyntactic plural feature. Plural marking in Quechua is always optional, and tends to be dropped where there is no chance of ambiguity, such as where the DP contains a numeral. Hence, both of the following are grammatical translations of 'in their two houses':

(30)   a. ishkay wasi-n-llapa-kuna-pi
           two   house-3POSS-pplu-plural-in

        b. ishkay wasi-n-llapa-pi
           two   house-3POSS-pplu-in
           'in their two houses'

Where *-kuna* is not present but plurality is 'implied', *-llapa* can still invert with *-pi*. Therefore, it seems that linear adjacency is truly the crucial constraint on this operation:

(31)   ishkay wasi-n-pi-llapa
           two   house-3POSS-in-pplu
           'in their two houses'

That linear adjacency plays a role indicates that this operation must follow VI-insertion and the preliminary linearization of the output of syntax. The total optionality and semantic vacuity of the processes further support the idea that a PF operation is at work here (it is well known that other PF-processes, especially phonological rules, are frequently marked as being optional — see Vaux 2008 for discussion of this point). An obvious way to account for the data so far would be to assume that the order after preliminary linearization is that in (29a), and then to set up two optional rules of Local Dislocation, one inverting *-llapa* with *-kuna*, and the other inverting *-llapa* with a post-position:

(32) llapa   kuna   → 2 1 (optional)
        1   2

(33) llapa   postposition   → 2 1 (optional)
        1   2

The absence of a rule of *-kuna* inversion now captures the ungrammaticality of (28b), and the assumption that rule (33) requires linear adjacency (like all instances of LD) also captures the ungrammaticality of (29b). But now an interesting question arises: given the existence of both of these rules and the underlying order in (29a), could rule (32) feed rule (33), in a derivation such as the following?

(34)   Underlying Representation   wasi-n-llapa-kuna-pi

                         Rule (32)   wasi-n-kuna-llapa-pi

                Rule (33) & Output   wasi-n-kuna-pi-llapa

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14   Speakers vary as to which post-positions they allow to precede *-llapa*, and I am not sure what all the generalizations are yet. This is the reason for the vague formulation here. I am yet to meet anyone who does not allow this inversion with *-pi*, however.

As we can see, the requirement of linear adjacency is respected here because rule (32) places *-llapa* next to the postposition, causing the structural description of rule (33) to be met. What we find, however, is that the resulting word is ungrammatical in Cajamarca:

(35)   * wasi-n-kuna-pi-llapa

Why can't rule (32) feed rule (33)? In fact, this falls out already from standard assumptions regarding the nature of LD, as introduced in Section 1. To see this, recall the structure of the Quechua DP that we settled on in (18). On the assumption that little-n hosts the uninterpretable phi-features of the possessor in this variety, and abstracting away from the demonstrative, numeral and adjective, the preliminary linearization of this structure will be as follows

(36)   noun root*phi-features*Cl^0*P^0

The VIs for each of these positions will be inserted straightforwardly from the root outwards as the structure is linearized. How this occurs with relation to the phi-feature bundle needs some discussion, however. We have seen ample evidence that *-llapa* is a separate morpheme from the person morphemes which it pluralizes. Uninterpretable phi-features in the Cajamarca DP are assumed to be represented as a bundle of features on little-n in the syntax, and so this spell-out as two separate VIs needs to be accounted for as a fact of morphology. The traditional approach to this within DM has been to invoke the operation of Fission (Halle and Marantz 1994; Halle 1997). Despite the problem that this operation has in accounting for a typological generalisation concerning the absolute order of person and number morphemes (see footnote 3 and references therein), I shall invoke it here for the sake of simplicity. I assume therefore that the bundle of phi-features is marked for Fission. Thus, once a particular feature of the bundle has been spelled out by a VI, the rest of the features split off and can be spelled out by some other VI. For the sake of illustration, I introduce the following VIs for 3rd person and for personal plural:

(37)   llapa↔[pplu]
          n↔[-author, -addressee]

The spelling out of a 3rd person plural possessor's phi features would then proceed as follows:

(38)   {-author, -addressee, pplu} → Insert 3rd person VI, pplu Fissions off
          n*{pplu} → Insert pplu VI
          n*llapa

The order of insertion of these VIs must be stipulated on this approach (see Trommer 2002 and Harbour 2008 for alternatives). Once VI-insertion and preliminary linearization have affected the whole structure in (36), we have the following:

(39)   wasi*n*llapa*kuna*pi

Where *-kuna* happens to be absent, the structure will instead be as follows:

(40)   wasi*n*llapa*pi

Now, in a structure like (40), rule (33) will be able to apply, correctly predicting that *wasi-n-pi-llapa* is grammatical. If there is no case marker in the structure but *-llapa* and *-kuna* are both present, then the structural description of rule (32) will be met. Since the rule is optional, both *wasi-n-llapa-kuna* and *wasi-n-kuna-llapa* are correctly ruled in. But now consider the structure in (39). In this case the SD of rule (32) is once again met. If it applies to (39), then it will replace the linearization relation between *-llapa* and *-kuna* with a relation of adjunction (see section 1), yielding the following structure:

(41)   wasi*n*kuna+llapa*pi

Crucially, the output of this rule does not meet the structural description of rule (33). For what is adjacent to *-pi* here is not *-llapa*, but a complex element *kuna+llapa*. This is why rule (32) can never feed rule (33).[15]

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15   In fact, the constraints on LD are strong enough that it would be possible to collapse rules (32) and (33) into a single rule which inverts *-llapa* with whatever is to its right, capturing the same data. I have elected not to do this for two reasons. Firstly, some speakers seem to vary in how they treat these processes. One consultant strongly prefers *-llapa* inversion with *-kuna* where it is possible, whilst preferring the order *-llapa-pi* over *-pi-llapa*. This may indicate that inversion with *-kuna* and inversion with case markers are best treated as genuinely separate processes,

The logically possible and actually possible orderings of these affixes are presented below, along with a summary of how the account presented here captures them.

(42)   a. wasi-n-llapa-kuna-pi   (rule 32 optionally fails to apply)
        house-3POSS-pplu-plural-in
        'In their houses'

        b. wasi-n-kuna-llapa-pi   (rule 32 optionally applies; rule 33 cannot apply)

        c.*wasi-n-pi-kuna-llapa (cannot be derived; no rule inverts -pi and -kuna)

        d.*wasi-n-pi-llapa-kuna (cannot be derived; rule 32 is strictly local)

        e.*wasi-n-llapa-pi-kuna (cannot be derived; no rule inverts -pi and -kuna)

        f.*wasi-n-kuna-pi-llapa (cannot be derived; rule 32 cannot feed rule 33)

It is hard to imagine how these strange properties could be made to follow from a purely syntactic model of affix ordering. We have already seen that the importance of linear adjacency, the lack of semantic effect, and the optionality of these processes further support the idea that they belong to the PF component of the grammar, and specifically that they are instances of the operation Local Dislocation as postulated by Distributed Morphology.

It is interesting to note that, in accordance with Embick's (2007b) conjecture concerning consistency, this instance of LD can indeed be construed as applying across phase boundaries, assuming that little-n, the host of *-llapa*, is a phase-head. Let us move on to our second piece of evidence for post syntactic operations: the interaction between *ni-* insertion and *-lla* displacement in Bolivian and Huallaga Quechua.

4   *ni-*INSERTION AND *-lla* DISPLACEMENT IN BOLIVIAN AND HUALLAGA QUECHUA

Before introducing the data on the post-syntactic operation to be described in this section, it is necessary to discuss the phonological process of *ni-* insertion.

4.1   *ni-* Insertion

The phenomenon of *ni-* insertion appears to be present in many forms of Quechua (Adelaar 2004, a survey of Andean languages, does not name any Quechua varieties that lack it). Examples of it from Cajamarca and Huallaga are given below. Basically, whenever a suffix which begins with a consonant cluster or consists solely of a single consonant or glide is added onto a noun which ends in a consonant or a glide, the suffix *ni-* must be inserted between the two (Huallaga examples from Weber 1976). The second example from Huallaga shows that long vowels also trigger the process in varieties that have them.

(43)   a. wasi-y   ñan-ni-y   not *ñan-y (Cajamarca)
           house-1POSS   path-NI-1POSS
           'my house'   'my path'

           bistya-yki   qellay-ni-ki   not *qellayyki
           horse-2POSS   money-NI-2POSS
           'your horse'   'your money'

        b. wasi-ynaq   atoq-ni-ynaq   not *atoq-ynaq   (Huallaga)
           house-less   fox-NI-less
           'homeless'   'foxless'

           papa-n   papa:-ni-n   not   *papa:n
           potato-3POSS   father-NI-3POSS
           'his potato'   'his father'

Adelaar (2004:206) suggests that *ni-* insertion applies because 'Word-final consonant clusters and medial clusters of more than two consonants are not allowed'. However, since long vowels also trigger *ni-* insertion, it seems to me that the most

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independently embodied in the rule system. Furthermore, the VI *-llapa* can mark plurality on verbal agreement too, and in these contexts its placement is rigid, hence it seems prudent to have rules specifying which affixes *-llapa* is allowed to invert with.

general formulation of this process is to say that it applies because super-heavy syllables are banned, where super-heavy syllables are those whose rhymes contain three moras. Let us assume that vowels are assigned one mora, long vowels and diphthongs two moras, simple codas one mora, and complex codas two moras (where a complex coda is one containing more than one consonant). The constraint against super-heavy syllables now correctly predicts all the environments for *ni*-insertion illustrated above.[16]

An apparent exception to this is the suffix *-yuq*, also spelled *-yoh*. This means roughly 'owner of', and we can see that it triggers *ni*- insertion too.

(44) mishu-yuq   buyis-ni-yuq   not *buyis-yuq   (Cajamarca)
      cat-owner   oxen-NI-owner   oxen-owner

This is unexpected by my syllable-based account, for while *-yuq* does begin with a glide, this glide is supported by a vowel, and hence any consonant that ends up preceding it should simply become part of a complex onset, with [j] as its second element. There is certainly no phonological ban on such onsets in Quechua — they can regularly be found in both native and non-native roots, and can be created when the suffix *-ya*, which derives intransitive verbs from nouns and adjectives, is added onto consonant-final words (examples from Cajamarca, syllable boundaries indicated with full stops):

(45)   Spanish borrowings   native roots
       an.syas 'vomiting'   a.nyay 'to argue'
       bis.tya 'horse'   qe.shyaq 'ill'
       dyu.su.lu.pa.gi 'thankyou'   u.pyay   'to drink'

       formations with *-ya*:
       a.chik 'dawn'   a.chi.kyay 'to dawn'   (cf. achik-ni-yuq 'owner of the dawn')
       a.tun 'big'   a.tu.nyay 'to grow'   (cf. atun-ni-yuq 'owner of a big one')

I propose that *-yuq* is simply lexically specified to trigger *ni*- insertion when preceded by a heavy syllable, and that synchronically *ni*- insertion before *-yuq* is not part of the process's more general function as a repair for illegal syllable structures. This looks uncomfortably like a stipulation whose only purpose is to save my syllable-based account, but in fact this analysis predicts that *ni*- insertion should be less diachronically stable where *-yuq* is concerned (since in this environment it is conditioned by a lexical idiosyncrasy, whereas in other cases it is conditioned by a very general phonological constraint). This appears to be correct — Weber (1976, 1989) states that *ni*- insertion has become optional in Huallaga Quechua before *-yuq* but not before any other affix that triggers it, reporting (1976: 72) that 'atoq-yuq' and 'antoq-ni-yuq' ('owner of a fox') are acceptable.

This completes our discussion of *ni*- insertion — it applies to destroy super-heavy syllables when these are created by the nominal morphology, and is also triggered where *-yuq* appears after a heavy syllable, as part of a lexical idiosyncrasy of that affix. Let us now move on to consider *-lla* displacement.

4.2   *-lla* displacement

-lla (variously pronounced [λa], [ža] or [dja], depending on the dialect) is called by Adelaar (2004:217) 'a suffix referring to limitation'. It typically means 'just' or 'only', but also has a range of more subtle uses which are much harder to translate (Weber 1989:357 classes it as one of his 'shading suffixes', so called 'because they add fine shades of meaning').

In some dialects, *-lla* simply cliticizes onto the word it takes scope over. In nouns, this will usually mean outside of possessive, number and case markers. Cajamarca is a dialect like this. *-lla*'s position on nouns is stable, as we can see from these examples (Quesada 1976:147):[17]

(46)   a. wasi-lla
          house-just
          'just the house'

       b. wamra-kuna-lla
          child-plural-just
          'just children'

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16   Further evidence that a constraint of this kind exists in Quechua comes from the allomorphy of the evidential clitics. Many of these have one form which ends in the vowel [i] and another form without the vowel, e.g. 1ˢᵗ hand information in Cajamarca is marked either by [mi] or [m], 2ⁿᵈ hand information either by [ʃi] or [ʃ], conjecture by retroflex [tʃi] or [tʃ]. Both forms are allowed when the clitics attach to vowel-final words, but if the word ends in a consonant, a glide or a long vowel, then only the form with [i] at the end can appear. This can be explained in terms of our syllable-based constraint: '*atoq-m' is out, but the form 'atoq-mi' presents no problems, for the [i] provides the nucleus of a new syllable for which [m] can form an onset, and the rhyme of the syllable [toq] is now only bimoraic, and thus legal.

17   *-lla* does show some unusual placement properties in verbs in Cajamarca. These are not relevant to the discussion at hand, however.

    c. qo-wa-y   ashl-ita-ta-lla
      give-1o-IMP bit-DIM-Ac-just
      'Give me just a little bit'

    d. noqa tanta-ta-lla   ranti-rqa-ni
      I   bread-Ac-just buy-past-1s
      'I bought only bread'

In other dialects, however, the position of *-lla* is more variable — this is the case is Huallaga and Bolivian. Beginning with Huallaga, Weber notes (p.358) that *-lla* 'generally precedes' possessive person markers. he opposite order is described as 'strange (although perhaps not entirely wrong)':

(47)   ? kiki-:-lla   ? kiki-ki-lla
        self-1POSS-just   self-2POSS-just

        kiki-lla-:   kiki-lla-yki
        self-just-1POSS   self-just-2POSS
        'just myself'   'just yourself'

Weber also reports (p.358) that, sometimes, '-*lla* follows the possessive, the pluralizer, and the case marker. This happens quite generally when *-kuna* 'plural' occurs in the word'. This is illustrated in (48) ((Weber's (1491a)). Although this is reminiscent of the locality restrictions on *-llapa* inversion seen in the preceding section, (49) shows that *-lla* can appear before possessive markers even in the presence of *-kuna* (p. 362, Weber's (1505)):

(48)   kiki-n-kuna-lla
        self-3POSS-plural-just
        'only themselves'

(49)   kiki-lla-yki-kuna   ka-ku-pti-ki-qa
        self-just-2POSS-plural   be-refl-sub-2s-TOP
        'If you are just yourselves…'

The positioning of *-lla* with regard to case-markers is variable. It follows some, such as *-pita*, meaning 'from' (p. 358, his (1492)), but precedes others, as is the case with accusative *-ta* (p. 361, his (1503)). The marker *-naw*, meaning 'at the same time as', can precede or follow it (p. 360, his (1498)).

(50)   qam-kuna-pita-lla
        you-plural-from-just
        'just from you (pl.)'

(51)   Ñawpa-:   kullu-lla-ta   mutu-nki
        side-1POSS   stump-just-Ac   chop-2s
        'Just chop the stump which is beside me (and don't chop me)'

(52)   a. yarpa-sha-n-naw-lla-mi
          think-sub-3s-as-just-Ev1st

      b. yarpa-sha-lla-n-naw-mi
          think-sub-just-3s-as-Ev1st
          'just as he thinks'

We see a similar situation in Bolivian Quechua. We have already seen in Section 2 that, unlike in Cajamarca and Huallaga, nominal plural morphemes precede possessive morphemes in Bolivian Quechua (Bills et al. 1969: 225). The nominal plural also has a wide range of allomorphs in this variety (Lastra 1968: 26-7). To summarise Lastra's discussion, *-s* (or, more rarely, *-skuna*) is added on to vowel final stems (e.g. wawa-s 'children'), *-es* is added on to some Spanish loans with final consonants, *-kunas* appears only on consonant-final stems, and *-kuna* can appear in any of these positions. *-lla* in this variety precedes all case-markers (Bills et al. 1969: 72), with the exception of *-rayku*, 'because of' (Lastra 1968: 29):

(53)   Rik''u-ni wiraqucha-lla-ta
        see-1s   gentleman-just-Ac
        'I saw only a gentleman'

(54)   wasi-y-rayku-lla
        house-1POSS-because.of-just
        'just because of my house'

It also precedes possessive markers, as shown in (55), but follows the plural markers, as shown in (56).

(55)   wawa-lla-y
        child-just-1POSS
        'just my child'

(56)   wawa-s-lla
        child-plural-just
        'only the children'

This sub-section has introduced the basic facts of *-lla* displacement. The next one will discuss the strange interaction between this process and *ni-* insertion.

4.3   *-lla* displacement counterbleeds *ni-* insertion

Now, these examples of *-lla* appearing in unusual places involve it preceding possessive markers and case markers. It happens that possessive markers always begin with a consonant/glide cluster, or, in the case of first person marking in Huallaga, consist solely of vowel length. Hence, they are the sorts of affixes that trigger *ni-* insertion when they are combined with stems which end in a heavy syllable, as illustrated here for Bolivian Quechua:

(57)   wawa-s-ni-y
        children-plural-NI-1POSS
        'my children'

We can see from (56) that *-lla* itself does not trigger *ni-* insertion, so the placement of *-lla* between a stem and the relevant suffixes destroys the conditioning environment for *-ni* insertion. Crucially, however, we see that *ni-* insertion *nonetheless applies* in these situations. In Bolivian Quechua it seems that it must apply; in Huallaga its application is optional, a point to which we shall return:

(58)   wawa-s-*(ni)-lla-y   (Bolivian Quechua)
        child-plural-NI-just-1POSS
        'just my children'
        (Bills et al. 1969: 225)

(59)   a. kikish-ni-ki   (Huallaga)
        b. *kikish-yki
        c. kikish-ni-lla-yki
        d. kikish-lla-yki
        '(just) your armpit'
        (Weber 1989: 359, his (1494))

What is going on here? It seems that the process of *ni-* insertion is somehow applying before the process that places *-lla* in its unusual position, so that *-lla* displacement counterbleeds *ni-* insertion. In order for this to be reconcilable with the Y-model, in which phonology acts on the output of syntax, we are forced to assume that *-lla* displacement cannot result from a syntactic operation.nThe conclusion seems inescapable: what we have here is a classic rule-ordering argument for the existence of post-syntactic operations. The idea of analysing this interaction in terms of a morpheme-permuting operation applying after the phonological process of *ni-* insertion is far from new. In fact, it is suggested by both Bills et al. (1969) and by Weber (1976; 1989). Bills et al. (1969: 225, their (iii)) even spell out the sort of derivation that is required:
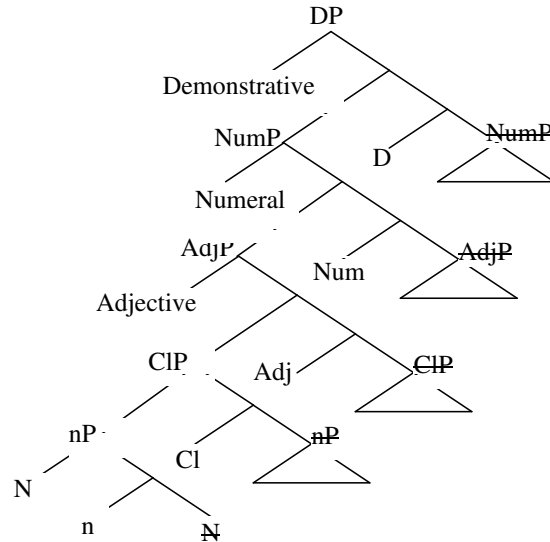
(60)   (a) Base Form: wawa-s-y+ DELIMITATIVE
        (b) Connective Insertion: wawa-s-ni-y+DELIMITATIVE
        (c) Delimitative Insertion: wawa-s-ni-lla-y

As well as these counterbleeding facts, Weber (1989: 359) makes two further arguments for analysing *-lla* displacement as a morpheme-permuting process. One is that, as we saw for Cajamarca, some dialects don't have these curious *-lla* orderings, and these dialects apparently always place *-lla* somewhere after the possessive markings. The second is that even in Huallaga *-lla* can surface after possessive and other *ni-* insertion-triggering suffixes in certain circumstances (see example (50)).

It is important to note that this phenomenon could not have been accounted for by DM as originally formulated (Halle and Marantz 1993, 1994) because, in that model, all morpheme-permuting operations took place before the application of phonological rules, predicting that counterbleeding interactions of the sort seen above should be impossible. However, more recent work in DM suggests instead that cycles of morphological and phonological rules are triggered each time a phase head is merged (Marantz 2001, 2007; Embick 2008; Marvin 2002 and Newell 2008). I will exploit this in what follows.
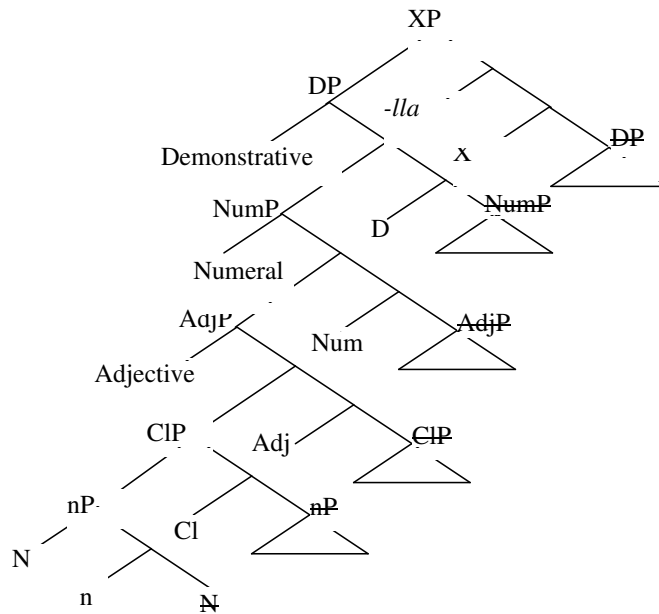
Recall the basic structure of Quechua nominals presented earlier:

(61)

Little-n and D are standardly assumed to be the phase-heads in the nominal domain (see Chomsky 2001 and the works on phase-based DM cited above). Hence, these must be what trigger cycles of morphological and phonological rules in Quechua. For space reasons I must abstract away from the complexities associated with the variable placement of *-lla* with regard to case morphemes, and will instead account only for the process that places *-lla* inside the possessor agreement morphemes in these dialects. How *-lla* is introduced into the syntactic structure is a problematic issue given the approach to linearization that I adopt. *-lla* has the semantics of an adjunct, and its ability to cliticize freely to words of any category also seems indicative of adjunct status. This suggests that it should be analysed as a non-projecting element. However, it is also a suffix, meaning that it must somehow come to be c-commanded by all the constituents of the word to which it cliticizes. This might suggest that *-lla* does in fact project, and induces its complement to move to its specifier in the usual way for functional heads in heavily OV languages (see Julien 2002). My proposal is that *-lla* is introduced in the same was as the adjective, numeral and demonstrative are in the structure in (61): in the specifier of a functional head. But unlike the functional heads introducing these other elements, the functional head introducing *-lla* merges its moved complement *after* the element *-lla* is merged, producing the structure seen here. Since *-lla* usually occurs inside case markers in Bolivian Quechua, this functional head presumably takes DP as its complement in that variety, as illustrated in (62). In Huallaga and Cajamarca, where *-lla* occurs outside of (most of) the case makers, we must assume that it takes a PP complement.
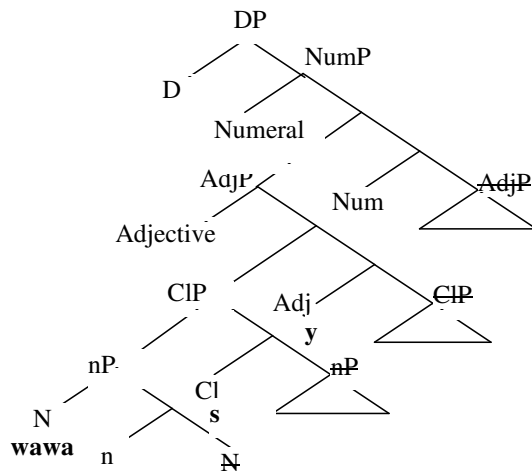
(62)

```
                              XP
                    DP            -lla
           Demonstrative            X
                 NumP          D      NumP
              Numeral                    DP
             AdjP       Num      AdjP
          Adjective
              ClP        Adj    ClP
           nP      Cl      nP
         N       n    N
```

Now, both little-n and D will trigger spell out and a morpho-phonological cycle. Let us see how this works with a Bolivian word like *wawa-s-ni-y*, 'my children'.

First, the noun root *wawa* is merged with the possessor (or perhaps with a bundle of interpretable phi-features where no possessor is overtly present) and the resulting structure is merged with little-n. The root is then spelled out as 'wawa' and then moves into the specifier of little-n. Cl^0 then merges with little-nP and moves the whole structure so far into its specifier. Adj^0 is then merged; it probes the possessor's phi-features and then moves ClP into its specifier (an Adjective may then be merged in a second specifier). Num^0 is then merged, and the roll up continues (again, a Numeral night be merged at this point). Then D, the phase head, is merged. This triggers spell out of NumeralP, including the possessor's phi-features. The structure up to this point now looks as follows, where spelled-out material is in bold:

(63)

```
                        DP
                 D           NumP
                        Numeral
                    AdjP          AdjP
                 Adjective  Num
                    ClP       Adj     ClP
                 nP      Cl     y   nP
               N       n    N
             wawa        s    N
```
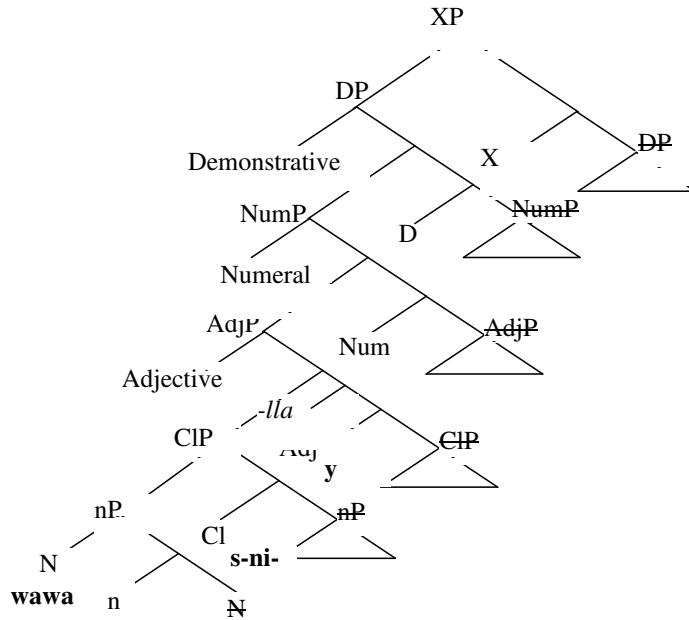
The merger of D also triggers a phonological cycle. Since the second syllable of [wawasj] is super-heavy, *ni*-insertion applies and we get *wawa-s-ni-y*. NumeralP then moves into the specifier of DP, and the derivation is complete.

The derivation of *wawa-s-ni-lla-y* is the same, except that now after the DP is completed (and thus after the phonological cycle in which *ni*- insertion takes place), the functional head introducing *-lla* is merged with DP as its complement. The resulting structure is as in (62) above. Then, when the next phase head is merged, *-lla* is moved via successive cyclic Lowering through specifiers to a position inside the head hosting the VI associated with possessor agreement — this will be to the inner specifier of spec-nP in Huallaga and Cajamarca, and the inner specifier of spec-AdjP in Bolivian.[18] This is illustrated for Bolivian in (64).

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18   We must assume the final landing site of this Lowering as a matter of stipulation. That it results in all three dialects in *-lla* appearing inside the possessor agreement morphemes, and nowhere else, is presumably an accident of the history of the Quechua family.

(64)

However, here we encounter a problem, for the Lowering operation posited here seems at odds with the properties that Lowering is predicted to have in Embick and Noyer (2001)[19]. Lowering is a morphological operation. Thus, it will always follow syntactic movement operations (at least, for the phase in which it occurs). Embick and Noyer sum up the consequences of this in their Late Lowering Hypothesis (p.567; their (18)):

(65)   *The Late Lowering Hypothesis*
        All Lowering in morphology follows all movement in syntax. Lowering can never remove an
        environment for syntactic movement.

They further argue that this means that syntactic movement can remove an environment for Lowering, because of the ordering relationship between these two processes dictated by the architecture of the grammar. The one empirical example of this that they give comes from English. The ungrammaticality of (66b) is supposed to follow from the fact that vP fronting here bleeds Affix Hopping (which Embick and Noyer formulate as the Lowering of T to v):

(66)   a. Mary said that she would quietly play her trumpet,
           and [$_{vP}$ quietly play her trumpet]$_1$ she did t_1

        b. *Mary said that she would quietly play her trumpet,
           and [$_{vP}$ quietly play-ed$_2$ her trumpet]$_1$ she t_2 t_1

As Embick and Noyer put it: 'In [66a] vP fronting makes it impossible for post-syntactic Lowering to move T to v. [66b] shows what would result if Lowering could precede vP fronting' (p. 567). The problem for the account of *-lla* displacement presented above should be obvious: I assume that Quechua DPs involve full roll-up movement, including in the case of the functional projection which introduces *-lla* (accounting for the fact that the latter surfaces as a suffix). These movements should render Lowering of the sort I propose impossible, by Embick and Noyer's reasoning.
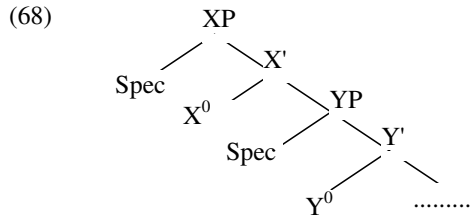
        However, there are two strong reasons to doubt that the example given by Embick and Noyer demonstrates that syntactic movement necessarily bleeds Lowering. Firstly, it is far from obvious that English verbal inflection is best analysed as Lowering, or that Do-Support is to be conceived of as a last-resort operation whose function is to rescue the spell-out of T when Lowering fails to apply. Biberauer and Roberts (2007) and Roberts (2002) present arguments that T's features are copied onto little-v via an agree relation, thus accounting for the appearance of tense morphology on English verbs despite the fact they do not move to T. They further note that Do-Support can in fact be conceived of as an operation triggered by non-default clausal semantics (thereby accounting for emphatic *do*, *do* in negation, and *do* in questions). This suggestion is directly related to the second problem with Embick and Noyer's example, which is, as they themselves remark (p. 567, n. 13), that '[t]he argument here is valid on the assumption that the *do* in the clause with ellipsis is not emphatic *do*'. Yet it seems clear that the vP fronting construction carries exactly the non-default semantics associated with emphatic *do*. For instance, (67a), without vP fronting but with emphatic *do*, is obviously a better paraphrase of (66a) than is (67b).

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19   I take it that the fact that *-lla* is a specifier rather than the head of a phrase is not a problem, since *-lla* is still a terminal node. Note that I must also assume that any other specifiers in the structure do not count as interveners able to block this Lowering.
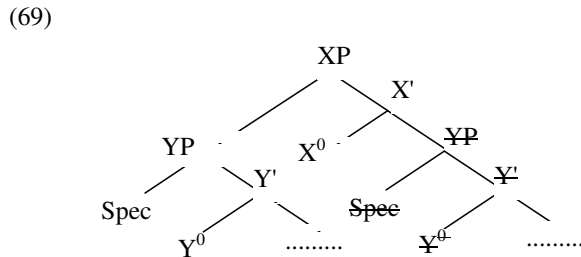
(67)   a. Mary said she would quietly play her trumpet, and she DID quietly play her trumpet.

        b. Mary said she would quietly play her trumpet, and she quietly played her trumpet.

What (67a) and (66a) have in common, which (67b) lacks, is that they both contrast what actually happened with some plausible alternative scenario, perhaps one in which Mary goes back on her promise and makes an enormous racket (cf. Rooth's 1985 notion of Focus Value, discussed in Zeller 2003). Presumably this contrastive nuance requires the presence of emphatic *do* in vP fronting structures. This is enough to derive the ungrammaticality of (66b), so there is no need to conclude that this follows because syntactic movement bleeds morphological Lowering.

Since the empirical case for saying that movement bleeds Lowering is not compelling, it seems worthwhile to re-examine Embick and Noyer's conceptual reasons for expecting that it should. Take a configuration such as the following:

(68)

Now, say that YP raises to a position c-commanding X^0, such as spec-XP. The resulting structure would be:

(69)

What Embick and Noyer argue is that, because this movement leaves YP in a higher position than X^0, Lowering of X^0 to Y^0 is impossible. There is no way for Lowering to apply 'before' YP movement of this kind, because, as we have already seen, morphological operations follow all syntactic operations. Hence (p. 567) 'we predict that no language should permit lowering of a head Y into an XP that subsequently raises above Y'

However, it is not clear that movement of this sort leaves nothing for the X^0 in (69) to lower on to, for there is in fact a copy of YP left in the complement of X^0, given the copy theory of movement. Let us return to the case of *-lla* displacement to see how this fact may allow us to understand the nature of the Lowering operation involved.

We have stated that *-lla* displacement is an instance of successive cyclic Lowering of a terminal node through several specifiers to a landing site in an inside specifier of the functional head that hosts possessor agreement. Given the copy theory, we can assume that this Lowering is not bled, since it takes place through the first-merged instances of each phrase. However, this leaves us with the problem of how to ensure that *-lla* is spelled out amongst the highest copies of the phrases in question. Notice, however, that *-lla* displacement is Lowering into an already-completed phase. Recall that Embick (2007b) has proposed that the linearization instructions associated with spelled-out phases should not be contradicted by post-syntactic operations affecting that phase. It seems reasonable that the PF interface should respect the integrity of phases in other respects also. We might formulate this requirement as follows:

(70)   *The Phasal Integrity Condition*
        If a post-syntactic operation affects a copy of an element of a given phase,
        then the effect of this operation is automatically reflected on all other copies
        of that phase.

This will ensure that when *-lla* is Lowered to the inner-specifier of the lower copy of the functional head hosting possessor agreement, it will also appear in the higher copy, which has already undergone a morpho-phonological cycle. Then, when the next phase head in the structure is merged, VI-insertion will apply to *-lla* in its new position illustrated in (64), since this is the highest position in which it is manifest. The result is that *-lla* displacement follows the process of *ni-* insertion. It thus counterbleeds it, as desired. There is a clear prediction concerning the possible interactions between post-syntactic

operations and phonological rules here: within-phase post-syntactic operations[20] will only be able to feed or bleed phonological rules (i.e., interact transparently with them), since they will always precede the phonological cycle for the phase they are in. Across-phase post-syntactic operations, such as *-lla* displacement, can only counterfeed or counterbleed phonological rules (i.e., interact opaquely with them) since they will always apply after the phonological cycle of the phase they are moving into. Finally, post-cyclic phonological rules will follow all morphological operations for their derivation, as was the case in classic DM.

It remains to deal with the apparent optionality of the counterbleeding interaction in Huallaga Quechua, which was seen in (59) above. Recent work in Rule-Based Phonology (e.g. Frampton 2008; Vaux 2008) treats constraints as a special case of a rule trigger: the banned configuration forms a special case of the Structural Description of a rule. This suggests that repairs are formally identical to ordinary rules. Thus, we should expect it to be possible for repairs to be optional, as ordinary rules often are. In addition, Vaux (2008) has recently proposed that inviolable output constraints, which have the power to crash a derivation at the last moment, are needed to capture the phenomenon of ineffability (also called absolute ungrammaticality- where a process yields an output that is unpronounceable). I propose to capture the optionality of *ni-*insertion when *-lla* displacement has applied in Huallaga as follows. Suppose that the *ni-* insertion rule is always optional in Huallaga, whereas it is compulsory in Cajamarca and Bolivian. This means that, at the point in the phonological derivation at which the *ni-*insertion rule can apply, it can optionally fail to do so in Huallaga. However, if it fails to apply and nothing happens later on in the derivation to destroy the super-heavy syllable (for instance, if *-lla* displacement does not occur), then an inviolable output constraint against super-heavy syllables will crash the derivation. Hence, *ni-* insertion will appear to be compulsory where *-lla* displacement is not involved, because all such derivations in which *ni-* insertion fails to apply will be crashed at the very end by this inviolable output constraint. The fact that *ni-* insertion is an optional rule is only revealed when there is in fact no super-heavy syllable in the output form- as when *-lla* displacement has applied, or when *-yuq* is the trigger (since *-yuq* does not create a super-heavy syllable; note that we now have a synchronic explanation for the optionality of *ni-* insertion before *-yuq*).[21] The following sample derivations illustrate the proposal:

(71)   *Derivations Where ni- Insertion Applies*

UR	[kikiʃj]	[kikiʃj+λa]
ni- insertion	kikiʃnij	kikiʃnij+λa
-lla displacement	-------	kikiʃniλaj
Output	kikiʃnij	kikiʃniλaj
*super-heavy	not violated	not violated

Derivations Where ni- Insertion Does Not Apply

UR	[kikiʃj]	[kikiʃj+λa]
ni- insertion	-------	-------
-lla displacement	-------	kikiʃλaj
Output	kikiʃj	kikiʃλaj
*super-heavy	violated	not violated

5   SUMMARY AND CONCLUSION

It seems undeniable that there is a post-syntactic, morphological component to linearization. The opaque interaction between *-lla* displacement and *ni-* insertion in Huallaga and Bolivian Quechua provides a compelling argument from rule-ordering in favour of this conclusion, and SVAP in the Quechua of Cajamarca displays a range of properties that we associate with the PF component, including semantic vacuity and being constrained by linear adjacency. While Julien (2002) is right to be wary of the additional power that post-syntactic operations give to the theory, we have seen that a range of strong predictions are still made by the model assumed here, particularly with regard to possible and impossible interactions amongst PF processes. However, the model is still compatible with the idea that syntactic hierarchical structure is inextricably linked to linearization. Indeed, the locality constraints on Local Dislocation rely on there being some preliminary linearization of the output of syntax. I see no obstacle to assuming that this preliminary linearization is dictated by asymmetric c-command relations.

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20   Recall that these will have to be instances of Lowering if Embick (2007b) is right that Local Dislocation is constrained to application at phase- boundaries.

21   I would like to thank Alastair Appleton for urging me to seek out a phonological explanation for this optionality, rather than the syntactic one that I proposed in an earlier version of this work. Thanks also to Bert Vaux for helping me with this analysis.

REFERENCES

Adelaar, Willem with Pieter Muysken (2004) *The Languages of the Andes.* Cambridge: Cambridge University Press.

Arad, Maya (2003) 'Locality Constraints on the Interpretation of Roots: The Case of Hebrew Denominal Verbs.' *Natural Language and Linguistic Theory* 21:4: 737-778.

Arregi, Karlos and Andrew Nevins (2008) *A Principled Order to Postsyntactic Operation.* LingBuzz/000646: retrieved 02/11/08.

Biberauer, T., A. Holmberg, and I. G. Roberts (2007) 'Disharmonic wordorder systems and the Final-over-Final Constraint (FOFC).' In A. Bisetto and F. Barbieri (eds.) *Proceedings of XXXIII Incontro di Grammatica Generativa*, 86-105.

Biberauer, T., A. Holmberg, and I. Roberts (2009) *A hierarchical universal and its consequences.* Talk handout, XXXV Incontro di grammatica generativa.

Biberauer, T. and I. Roberts (2007) *Subjects, Tense and Verb-Movement.* Ms., University of Cambridge.

Bills, Garland D., C. Bernardo Vallejo and Rudolph C. Troike (1969) *An Introduction to Spoken Bolivian Quechua.* Austin: University of Texas Press.

Chomsky, Noam (2001) 'Derivation by Phase'. In Michael Kenstowicz (ed.) *Ken Hale: a Life in Language.* Cambridge MA: MIT Press.

Cinque, Guglielmo (2005) *Deriving Greenberg's Universal 20 and its exceptions*. LingBuzz/000170: retrieved 24/04/09.

Coombs Lynch, David, Heidi Carlson de Coombs and Blanca Ortiz Chamán (1997) *Rimashun Kichwapi. Una introducción al quechua cajamarquino.* Lima: Atares artes y letras.

Embick, David (2007) 'Linearization and Local Dislocation: Derivational Mechanics and Interactions'. *Linguistic Analysis* 33: 303-336.

Embick, David (2008) *Localism versus Globalism in Morphology and Phonology.* Ms., University of Pennsylvania.

Embick, David and Rolf Noyer (2001) 'Movement operations after syntax.' *Linguistic Inquiry* 32: 555-595.

Embick, David and Rolf Noyer (2006) 'Distributed Morphology and the Syntax-Morphology Interface.' In Oxford Handbook of Linguistic Interfaces, pp. 289-324.

Frampton, John (2008) 'SPE Extensions: Conditions on Representations and Defect-Driven Rules.' In Bert Vaux and Andrew Nevins (eds.) *Rules, Constraints and Phonological Phenomena.* Oxford: Oxford University Press, pp. 220-251.

Halle, Morris (1997) 'Fission and Impoverishment.' *MIT Working Papers in Linguistics* 30: 425-449.

Halle, Morris and Alec Marantz (1993) 'Distributed Morphology.' In *The View From Building 20.* Cambridge, MA: MIT Press, pp. 111-176.

Halle, Morris and Alec Marantz (1994) 'Some key features of Distributed Morphology.' *MIT Working Papers in Linguistics* 21: 275-288. http://www.ethnologue.com/show_language.asp?code=qvc, retrieved 10/12/08.

Harbour, Daniel (2008) 'Discontinuous Agreement and the Syntax Morphology Interface.' In Daniel Harbour, David Adger and Susana Bejar (eds.) *Phi-Theory: Phi-Features Across Modules and Interfaces.* Oxford: Oxford University Press, ch. 7.

Julien, Marit (2002) *Syntactic Heads and Word Formation*. Oxford: Oxford University Press.

Kayne, Richard (1994) *The Antisymmetry of Syntax.* Cambridge, MA: MIT Press.

Kiparsky, Paul (1982) 'Lexical phonology and morphology.' In I. S. Yang (ed.), *Linguistics in the Morning Calm.* Seoul: Hanshin, pp. 3-91.

Lastra, Yolanda (1968) *Cochabamba Quechua Syntax.* The Hague: Mouton.

Marantz, Alec (2001) *Words*. LOT Summer School Handout.

Marantz, Alec (2007, to appear) *Phases and Words*. http://homepages.nyu.edu/~ma988/Phase_in_Words_Final.pdf)-last, accessed 08/03/09.

Marvin, Tatjana (2002) *Topics in the syntax and stress of words.* PhD dissertation, MIT.

Myler, Neil (forthcoming) *Form, Function and Explanation at the Syntax-Morphology Interface: Agreement, Agglutination and Post-Syntactic Operations.* MPhil thesis, University of Cambridge.

Myler, Neil (2009) *Semantically-Vacuous Variable Affix Placement in Cajamarca Quechua: Some Implications.* Talk given at the 4th Newcastle Postgraduate Conference in Theoretical and Applied Linguistics.

Newell, Heather (2008) *Aspects of the phonology and morphology of phases.* PhD dissertation, McGill University.

Noyer, Rolf (1992) *Features, Positions, and Affixes in Autonomous Morphological Structure.* PhD dissertation, MIT.

Quesada, Félix (1976) *Gramática Quechua-Cañaris.* Lima: Ministerio de Educación.

Roberts, Ian (2002) *On the Non-Anomalous Nature of English Verb Syntax: Evidence from Dialects.* Talk handout, XXVIII Incontro di grammatica generativa.

Rooth, M.E. (1985) *Association with Focus.* PhD Dissertation, University of Massachussets, Amherst.

Torero Fernández de Córdova, Alfredo A. (1964) *Los dialectos quechuas* in *Anales Científicos de la Universidad Agraria 2, 4.* Lima: La Molina, pp. 446-78.

Trommer, Jochen (2002) 'The Interaction of Morphology and Syntax in Affix Order.' In Geert Booij and Jaap van Marle (eds.) *Yearbook of Morphology 2002*. Kluwer, pp.283-324.

Weber, David (1976) *Suffix-as-Operator Analysis and the Grammar of Successive Encoding in Llacon (Huanuco) Quechua.* Instituto Lingüístico de Verano.

Weber, David (1983) *Relativization and Nominalized Clauses in Huallaga (Huánuco) Quechua*. University of California
          Press.
Weber, David (1989) *A Grammar of Huallaga (Huanuco) Quechua*. Berkeley: University of California Press.
Vaux, Bert (2008) 'Why the Phonological Component must be Serial and Rule-Based'. In Bert Vaux and Andrew Nevins
          (eds.) *Rules, Constraints and Phonological Phenomena*. Oxford: Oxford University Press, pp. 20-60.
Zeller, Jochen (2003) 'Moved preverbs in German: displaced or misplaced?' In Geert Booij and Jaap van Marle (eds.)
          Y*earbook of Morphology 2003*. Kluwer, pp.179-212.

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