The bifurcated nature of plural: Reconsidering evidence from English compounds

JEFFREY PUNSKE & SCOTT R. JACKSON

Southern Illinois University & *University of Maryland*[*]

1 Introduction

In this paper, we address a long standing assumption about English morphology: that regular plural morphology is generally banned within modifiers of compounds, while irregular morphology is generally allowed (see: Thomas-Flinders 1983, Kiparsky 1982, Hammond 1984, and Sproat 1985, among others). We argue that this pattern is illusory. It is brought about by a conspiracy of other restrictions derived through bifurcated Num(ber) functional heads (cf. Lecarme 2002, Borer 2005, Lowenstamm 2008, Wiltschko 2008, Alexiadou 2011, Kramer 2012, 2016, Mathieu 2012, 2014, and Adamson 2017, among others) and an incorporation analysis of English compounds coupled with cyclic spell out (Harley 2009, Jackson & Punske 2013). General patterns of allowing or disallowing plural modification are explained through selection of complements by a head, which is a consequence of the incorporation analysis.

The basic pattern is illustrated in the example sets below. Examples like those in 1 contrast with those in 2 where in 1 plural marking is disallowed on the left-element (modifier) of the compound but no such ban exists in 2.

(1) Regular Plural Inflection in English Compounds

dog-lover	*dogs-lover
rat-chaser	*rats-chaser
log-cutter	*logs-cutter
hand-made	*hands-made
finger-bowl	*fingers-bowl
coat-rack	*coats-rack
three-twinkie lunch	*three-twinkies lunch

(Sproat 1985:412)
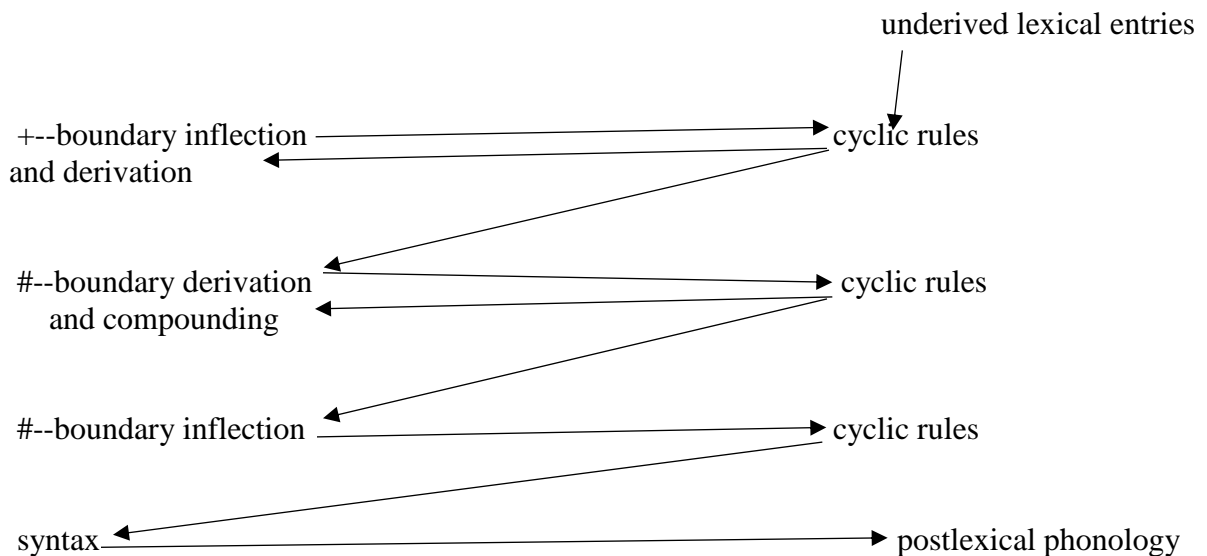
(2) Irregular Plural Inflection in English Compounds

> feet-first
>
> mice-infested
>
> teeth-marks
>
> alumni-club
>
> menfolk   (Sproat 1985:413)

The patterns found in 1 and 2 led theories such as Lexical Phonology (cf. Kiparsky 1982) to divide the morphological system into multiple strata. This is illustrated in the model from Thomas-Flinders (1983) below. In Lexical Phonology, irregular morphology is permitted within compounds because it occurs at an earlier stratum.

(3) Lexical Phonology

underived lexical entries

+--boundary inflection ——————————————→ cyclic rules
and derivation ←—————

#--boundary derivation ←—————— cyclic rules
and compounding ←—————

#--boundary inflection ——————————————→ cyclic rules

syntax ←————————————————————————————→ postlexical phonology

(Thomas-Flinders 1983:114)

Exceptions to this generalization are fairly common, as in pluralia tantum (see: 4) or group meanings (as in 5) where regular plural marking is available or even required.

(4) Plural Inflection on Pluralia Tantum Forms in English Compounds

        pants-pocket

        alms-giver

        odds taking   (Siddiqi 2009:57)

(5) Plural Inflection on Group Meanings in English Compounds

        systems analyst

        parks department

        admissions committee

        numbers racket

        reservations deck

                                            (Hammond 1984:30)

Selkirk (1982) uses examples like those in 5 to develop an analysis based on a context-free grammar and argues against level-ordering. However, for many analyses, these regular forms are regarded as a subclass of irregulars, side-stepping the issue of why regular morphology is allowed to appear in the left-element. Gordon (1985:88) argues '… they [group meaning compounds] are similar to the case of pluralia tantum in that one might consider the plural form in that particular usage to be a semantically idiosyncratic separate lexical form'. Gordon goes on to argue that if we accept these as special lexical forms they pose no problems for level-ordering or Lexical Phonology. Similarly, Siddiqi's (2009) fusion analysis requires that forms like *parks* found in *parks department* in 5 undergo an identical process of fusion as irregulars such as *mice* found in *mice-infested* in 2. Under this analysis, both *mice* and *parks* must be stored in the lexicon as separate, whole forms (see relevant discussion in Punske 2016a). We return to a discussion of Siddiqi 2009 in section 4.

    Based on data like those from 4 and 5, Sproat (1985:420) makes the observation given in 6 below which he identifies as a 'rough characterization':

(6) The left member of a compound must be unmarked for number, unless the plural is interpreted collectively or idiosyncratically. (Sproat 1985:420)

Hammond (1984:41) similarly develops the Inflectional Access Constraint and the Relativized Inflectional Access constraint to account for examples like those in 5. For Hammond, '…these examples exhibit internal inflection, the internal inflection is not interpreted by the syntax as inflection'.

Our present work is, in many ways, a formalization of Sproat's and Hammond's constraints and observations about compounds within the framework of Distributed Morphology. We argue that 'group' interpretations are a consequence of a bifurcated Num(ber) structure (as part of a universal structural spine) where, in English, the feature [INDV] (for individuation) is housed in a higher functional head (Num). Crucially, we argue that this higher Num head is outside of the cyclic structural domain that delimits the modifier itself. That is, because the [INDV] feature is higher up in the bifurcated structure, it is unable to be associated with the compound modifier during the derivation of the compound.

Our analysis is motivated empirically by two general observations. First, irregular plurals are not always allowed in compound modifiers, which casts doubt on the explanation being purely a matter of regular vs. irregular morphology. Second, regular plurals are easily found when the interpretative circumstances are correct, which hints at the true nature of the restriction. Examples of these observations are given in 7.

(7)	**Singular**	**Plural**
Regular	rat-catcher	*rats-catcher
	dog-lover	*dogs-lover
	*pant pocket	pants pocket
	*odd maker	odds maker
	park department	parks department
	number game	numbers game
	rat lab	rats lab
Irregular	woman chaser	*women chaser
	toothbrush	*teethbrush
	*(wo)manfolk	(wo)menfolk

*alumnus club	alumni club
mouse infested	mice infested
person mover	people mover

In fact, the gaps seem to pattern very clearly with possible interpretations. We claim that regardless of regularity, singular modifiers are required when an individuating interpretation is required, plurals are required for a collective/group interpretation, and in cases where both are allowed, there are clear differences in meaning, such that the plurals support collective or idiosyncratic interpretations. This pattern is illustrated in 8, which matches the pattern of grammaticality in 7.

| (8)	**Individuated**	**Collective**
Regular	rat-catcher	-
	dog-lover	-
	park department	parks department
	number game	numbers game
	rat lab	rats lab
Irregular	woman chaser	-
	toothbrush	-
	-	(wo)menfolk
	-	alumni club
	mouse infested	mice infested
	person mover	people mover

As we show throughout, the patterns in 7 and 8 exhibit a great deal of systematicity. We argue that this systematicity is best accounted for through an incorporation analysis which allows the head of the compound to select for its complement (which incorporates to become the modifier). In the next section, we describe the underlying theoretical assumptions that underpin this analysis.

2 Theoretic background

Our core analysis is based on a synthesis of two previous analyses: an incorporation analysis of compounding, and an analysis of nominal Num(ber) as a bifurcated functional structure. We assume that compounding involves the incorporation of the modifier into the root following Harley (2009) (see also Wiltschko 2009a). We further assume, following Jackson & Punske (2013) that the incorporated modifier must be contained in a derivational phase, in the broad sense of Chomsky 2000, 2001, 2008, etc. We assume a bifurcated Num structure following Kramer's (2016) account of Amharic, among others. Finally, we assume, following Ritter & Wiltschko (2014), that languages share a universal spine of functional projections though the featural content of each functional head may vary. These analyses are discussed in more detail in the following subsections.

2.1 Compounding

We follow Harley (2009) in claiming that compounding involves incorporation of the modifier (cf. Baker 1988). Harley (2009:136) proposes that '[s]ince incorporated elements satisfy their Case needs by incorporation in Baker's system, let us assume that the feature which drives incorporation is Case-related'. The basic structure of this incorporation is given in 9 below.

(9)

(ex. 9 from Harley 2009:136)
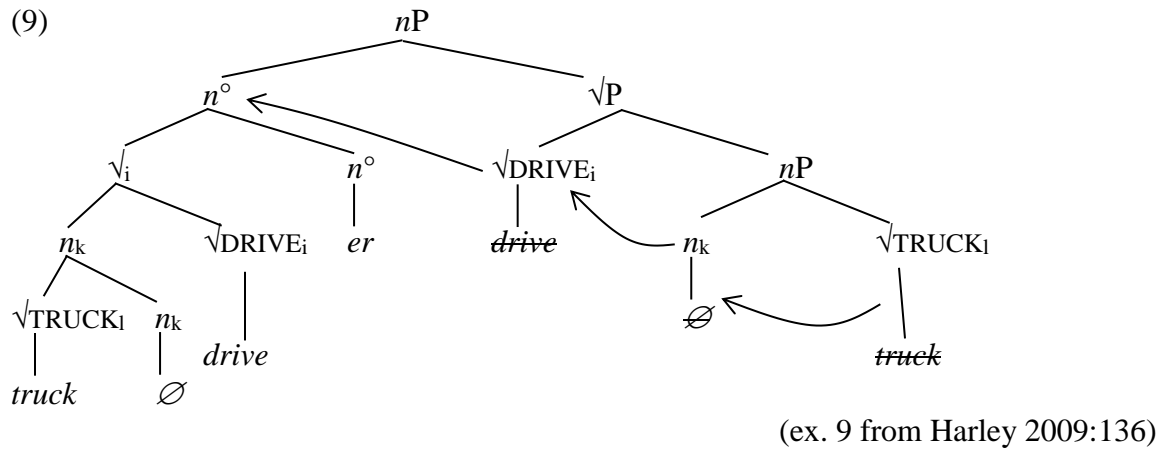
Under Harley's analysis, because the incorporation is Case-driven, the presence of plural and other functional structure (such as D) prevents incorporation: 'If an nP is merged with Num° or D° material, that Case-related nP feature must be checked DP-internally; the feature is no longer

accessible for checking via incorporation into a Root' (Harley 2009:141). We maintain this analysis here, though we account for a wider array of plural marked compound modifiers.

Jackson & Punske (2013) expand Harley's analysis to account for so-called 'compound stress'. Under their account, the same phase-based stress rules which have been independently argued to apply more generally at the sentence level (see: Adger 2007, Dobashi 2003, Legate 2003, Ishihara 2007, Jackson 2007, Kahnemuyipour 2009, Kratzer & Selkirk 2007, Samuels 2009, Sato 2009) also apply within compounds. This extension of sentence-level stress rules to (derived) word-level stress rules is straightforwardly predicted in a framework such as Distributed Morphology, in which morphological structure is not distinct from sentence-level structure. Critically for this account, the nP is a phase, which we continue to assume here.

2.2 Number

We follow Kramer (2016) (see also: Lecarme 2002, Borer 2005, Lowenstamm 2008, Wiltschko 2008, Alexiadou 2011, Mathieu 2014) in assuming that number is split between multiple syntactic heads. We base the present analysis primarily on the one developed in Kramer 2016. Kramer (2016) argues for the structure 10 below:

(10)   Number domains adapted from Kramer (2016:534)

NumP   = Domain of regularity

Num nP   = Domain of irregularity

n √
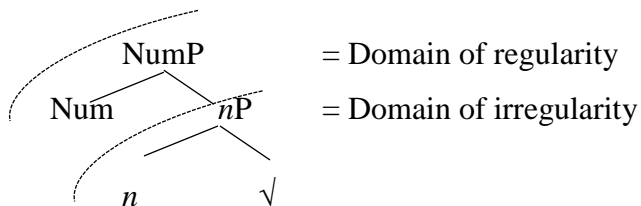
We propose that Kramer's structure is universal, thus applying as well to English. However, we assume that languages can vary in the featural make-up of Num and n.

3 Analysis

By adopting the incorporation and bifurcated Num analyses outlined in the previous section, we can fully account for the distribution of English plural modification in compounds. In this section we outline how the bifurcated Num analysis can be applied to English and how, once this analysis

is combined with an incorporation analysis of compounding (with cyclic spell-out), one can derive the observed restrictions on the distribution of plurals in compound modifiers.

3.1 A split Num in English

One critical difference between English and Amharic (along with a number of other languages[1]) is that double plurals are not generally available in English. Thus, it may be reasonable to conclude from this that while Num is split in languages like Amharic, it is not split in English. To the contrary, we argue, along with Adamson (2017), that there are properties of English plural best explained through a bifurcated plural along the lines of Kramer (2016): namely, irregularity and allosemy. To explain the difference in behavior between Num and *n* in English and in Amharic we assume, following Mathieu's (2012, 2014) discussion, that the content of Num(ber) (his Div^0) may vary. Specifically, we assume that the particular features associated with a functional projection may vary from language to language, similar to the variation in d-features and INFL-features discussed in Wiltschko 2009b and Ritter & Wiltschko 2009, 2014, respectively.

As Ritter & Wiltschko (2014:1379) note in their discussion of INFL and the universal featural spine more generally, '…different languages may associate different types of content with the same universal category (INFL)'. Thus while INFL has a universal feature (an 'unvalued coincidence feature [*u*coin]', (Ritter & Wiltschko 2014:1379), different languages may associate INFL with different substantive content, or INFL may have not substantive content at all. We are drawing on this line of reasoning to capture the distinct behaviors of bifurcated Num in English and Amharic.

We argue that the bifurcated structure of Num is English is structured as in 11 below. The critical difference between English and Amharic under this approach is that there is a semantic distinction between the two positions in English but not Amharic. In English, the higher position, Num, encodes individuation while the lower position, *n*, encodes general plurality.

---

[1] Wexler (2002: 465-468) notes a number of different possible semantic impacts of the double plural in Yiddish contra discussion in Kramer (2016). However, given the assumptions about the featural make-up of Num outlined in this paper, such semantic differences would not fundamentally alter the present analysis of Kramer's (2016) discussion of Amharic.

(11)   Modified number domains adapted from Kramer (2016:534)

NumP   = Domain of individuation/regularity

Num   *n*P   = Domain of plural/irregularity

n   √
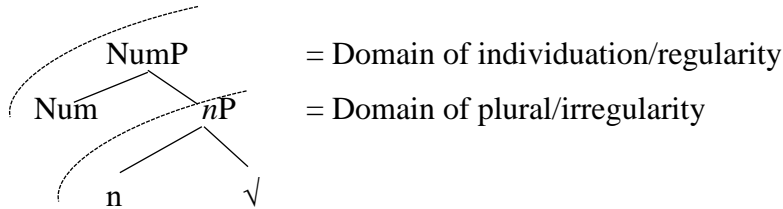
We assume an approach to regularity following Kramer's (2016) analysis of Amharic. 'Low number' may exhibit allomorphy, while 'high number' may not. We will not discuss here the ongoing questions of the derivation of allomorphy in Distributed Morphology and related frameworks (see Embick 2010, Bobaljik 2012, Merchant 2015, Punske 2016b, among others), but the approach we take most closely tracks with Embick 2010, as we assume that allomorphy is determined via syntactic adjacency and may be disrupted by cyclic domains.

What is crucial to our approach is that while the regular form of the English plural, *-s*, is typically realized in the higher number position, it may also be spelled-out in the low position when no competing irregular form exists. The lack of plural-stacking, like that found in Amharic, is likely a post-syntactic haplology effect (cf. Nevins 2010) or a Distinctness restriction (c.f. Richards 2010). A set of potential exceptional cases is discussed shortly.

Similarly, this cyclic spell-out analysis can account for the exceptional pluralization facts. Acquaviva (2016) notes in his discussion that in previous work, Acquaviva (2004, 2014) and Alexiadou (2011:204) develop an analysis wherein 'canonical count pluralization, which applies to count nouns, is structurally external to non-canonical pluralization (as on mass nouns)'. Sproat (1984:420) discusses a distinction raised in Gordon 1985[2] between *drink-cabinet* and *drinks-cabinet*, noting that the former 'could be any cabinet in which potable items are stored…' while the latter 'seems to refer preferentially to a cabinet for alcoholic drinks, where *drinks* is interpreted idiosyncratically'. Gordon (1985) suggests that such forms may be lexically stored.

However, we argue that the bifurcated number provides a ready explanation for such idiosyncratic forms. We follow Adamson (2017) in arguing for a 'strong locality constraint on contextual allosemy: within one categorial/cyclic head.' Therefore, when a plural is interpreted in the lower domain, it is interpreted within a cyclic head, and can thus receive an idiosyncratic interpretation. The fact that these plurals are non-individuating also follows from this same

---

[2] Cited in Sproat as Gordon 1984.

analysis, given the claim that individuation is interpreted only at the higher Num position, because this would be outside of the *n*P phase. The alignment between structure and allosemy potential is shown in 12. Similar phase-driven idiomatic interpretations are discussed in Svenonius 2005, Harley & Stone 2013, and Harwood 2013.

(12)   Allosemy in English number domains

NumP   = No allosemy

Num   *n*P   = Allosemy possible

n   √
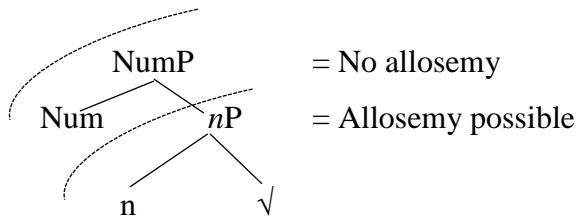
One potential set of counter-examples to the restriction on double plural in English are a set of a special plurals discussed in Acquaviva 2016. Acquaviva (2016:197) notes a number of non-pluralia tantum English plurals that do not carry the meaning 'many X':

(13)   Open list of English non-pluralia tantum plurals that do not mean 'many X'

> ashes, brains, crops, debts, depths, dimensions, directions, finances, foundations, funds, gates, heavens, heights, holidays, intricacies, loyalties, manners[3], mists, plans, preparations, proofs, rains, resources, results, skies, snows, suspicions, thoughts, times, views, waters, winds, woods…

Acquaviva (2016:197)

What is intriguing about this list is that these (plural) forms are virtually unattested within compounds. We may note that such forms when not marked by the plural may receive an interpretation more consistent with a mass noun:

(14) There is ash on the road.

However, these nouns do also retain their countability:

(15) John flicked an ash from his cigarette.

[3] Included in the list, however we believe this is a true pluralia tantum.

We argue that this suggests that these nouns have a special null *n* which carries the plural interpretation allowing for the contrast in 14 and 15. Overt plural marking realizing *n* is disallowed due to conventional contextual allomorphy. Forms like those in 13 involve the realization of plural in Num. Thus, the lack of these forms within compounds follows entirely from the analysis that we have presented here; Num cannot be incorporated as part of compound and each of these examples with overt plural marking involve Num.

In the next subsection we outline how the incorporation interacts with the bifurcated Num.

3.2 Incorporation analysis

Only the *n*P, not the larger NumP, can incorporate as a compound modifier. This follows entirely from Harley's (2009) analysis of compounding as case-driven incorporation, as discussed previously. Alternatively, we could delimit the size of an incorporate to a phase, thus preventing the larger Num from incorporating (though this would lose the motivation for incorporation).

(16)   Illicit compound structure
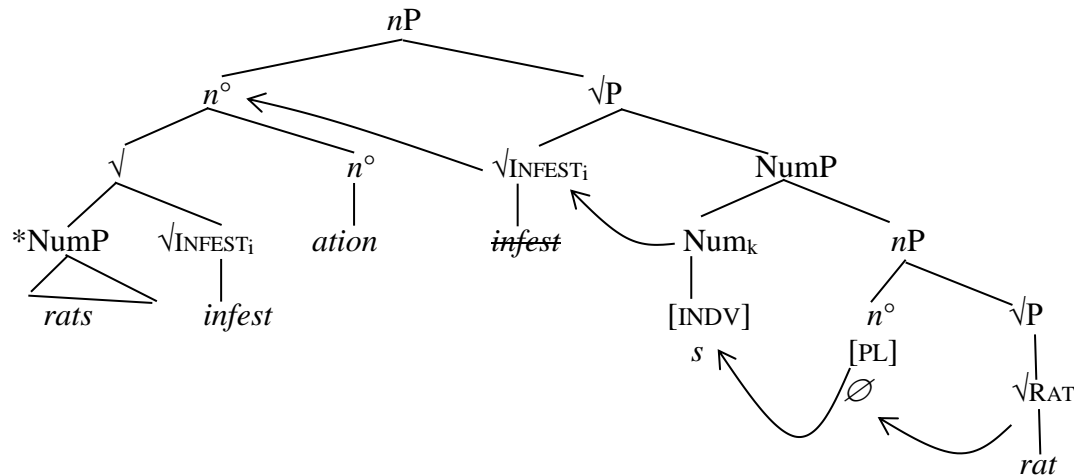
The structure in 16 accounts for a bulk of the unavailability of overtly marked plural modifiers in English compounds. Plural forms cannot be individuated within compounds because Num (which houses [INDV]) is outside of the *n*P phase that is being incorporated. Thus when a head requires that its complements be individuated, the plural is disallowed, because that larger structure including Num cannot be incorporated, and therefore cannot be part of a compound. This captures why forms such as those in 17 and 18 require the singular.

(17)   *dogs-lover ~ dog lover

(18)   *women chaser ~ woman chaser

In contrast, so-called collective or idiosyncratic forms do not require individuation (and may even prohibit individuation) and thus do not need Num. Therefore, since the plural itself is housed in *n* it may be incorporated into a compound structure as in 19-21.

(19)   parks department

(20)   numbers game

(21)   pants pocket

In *parks department*, the modifier *parks* represents a collective or group reading, distinct from *park department*. That is, a *park department* may be a department for the maintenance of a particular park, but a *parks department* is a department that deals with parks in general. The same analysis applied to *systems analyst* and many others, the key being that there is a collective rather than individuated interpretation.

In the case of *numbers racket*, the modifier represents an idiosyncratic meaning of the plural, which means something different than simply a plural of *number*. As discussed in the previous section, we analyze such idiosyncratic forms as having the plural feature on *n*, not the higher Num. This fits naturally into the incorporation analysis, because the idiosyncratic meaning is available because the root and plural are contained within the same derivational phase, which also means that it is available as the modifier of a compound, because the *n*P phase is incorporated, just as in regular compounds.

Finally, pluralia tantum cases such as *pants pocket* are accommodated because the plural inflection is not an individuating plural, and therefore does not reside at Num, but rather at *n*. Just as in all the other cases, this means that the entire plural is an *n*P and therefore can be incorporated into a compound.

In summary, the majority of cases can be explained straightforwardly by assuming that only non-individuating plurals can be contained in a structure small enough to incorporate (i.e. within the *n*P phase), and that there are several different types of non-individuating plurals available in English, including collective or group interpretations, idiosyncratic interpretations, and pluralia tantum.

3.3 Selectional consequences of incorporation

A key feature of the incorporation analysis is that the compound head and the 'modifier' stand in a head-complement relationship. The analysis of compound structure as head-complement goes back at least to Selkirk 1982, and it remains a key element of the arguments for an incorporation analysis of compounding (Harley 2009, Jackson & Punske 2013). A predicted consequence of this is that we expect the head to be able to exert selectional restrictions on the features of the complement. In terms of the present analysis, this means that we should expect that at least some compound heads should be able to select for or against non-individuating plural complements.

This prediction of the incorporation-based analysis is not only borne out, but it enables us to explain an otherwise difficult set of restrictions on compound modifiers. For example, this can explain why a pluralia tantum like *pants* must sometimes appear in its singular form *pant* as part of a compound. That is, whether or not it must appear as *pant* or *pants* or either is not a property of *pant(s)*, but rather a property of the head root and its selectional restrictions.

(22)   pants pocket ~ %pant pocket

(23)   *%pants leg ~ pant leg

If the ability to host plural were a property of irregularity or the pluralia tantum nature of a modifier like *pants* then the unacceptability of *pants leg* in 23 is unexpected. However, if the root has selectional requirements (requiring or disallowing a [PL] *n*) on its modifier, then the results in 22 and 23 are readily explained. Similarly, we can capture why it must be the singular *tooth* in the compound *toothbrush* not the irregular *teeth* in 24 below, without having to make strong claims that somehow *teeth* must be an individuating plural.

(24)   *teethbrush ~ toothbrush

Under a selectional account allowed by the incorporation-based analysis of compounding and the split Num hypothesis argued for here, we can also account for the systematicity of certain roots to allow or not allow plural compound modifiers, regardless of the (ir)regular status of the modifier. For instance, a root like *lab* seems to be able to co-occur with regular or irregular plurals (as in 25 and 26) while a root like *trap* may only occur with singulars, regardless as to whether the modifier is regular or irregular and in 27 and 28.

(25)   rats lab ~ rat lab

(26)   mice lab ~ mouse lab

(27)   *rats trap ~ rat trap

(28)   *micetrap ~ mousetrap

While it may possible to account for this distribution in other approaches to compounding (say, within a purely lexical approach), the selectional account provided by the incorporation-based approach to compounding seems best able to fully account for this distribution. The incorporation-based structure of *rats lab* is given in 29 below.

(29)   Well-formed compound structure
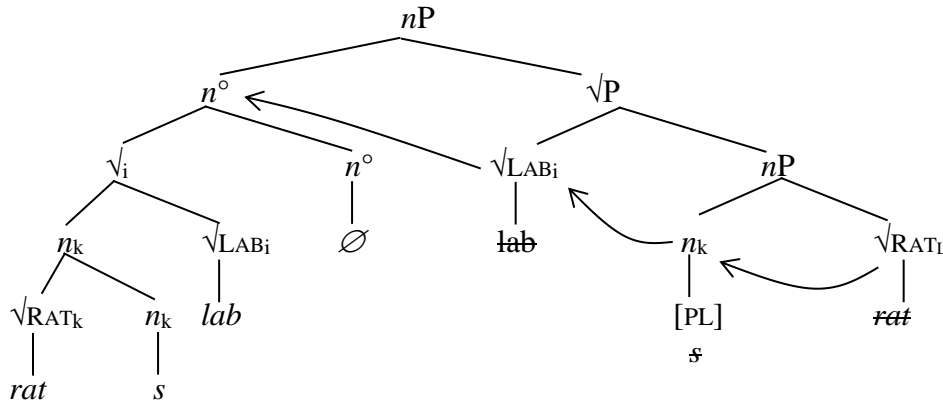
Note that this structure is identical to the one provided in Harley (2009), thus we can account for the availability of plurals in compound modifiers without the need for any additional modifications to the structure.

It is important to note that the ability of the compound head to select for +/-[PL] on its complement (i.e. on the compound modifier) does not obviate the rest of the analysis. Crucially, the head can never select for an individuating plural, because that is expressed in Num, not *n*. The head can select for or against non-individuating plurals such as pluralia tantum, and it can select against plurals that might otherwise be allowed as collective/group readings, such as **teethbrush*. But in our analysis, the selectional restrictions alone cannot account for the full range of data. It is simply the mechanism by which some lexical restrictions can appear within the constraints of the structure. Put another way, our general analysis allows us to derive compounds such as *parks department* without simply 'lexicalizing' *parks* as distinct from *park-s* (as Siddiqi 2009 must, for

example) but there is still a role for lexicalization in our analysis, specifically in the ability of the compound head to select for or against (non-individuating) plural marking, which is needed to explain restrictions on forms such as *pants leg* or *teethbrush*. We take examples such as these to be true cases of lexical restrictions, defined narrowly through head-complement selection.

4 Comparison with other approaches

In this section, we compare the approach offered here with the two approaches most similar to ours: Siddiqi 2009 and Wiltschko 2008. We show that neither approach can sufficiently account for the pluralization data.

As previously mentioned, Siddiqi (2009) offers a fusion based account of plural modifiers in English compounds. For Siddiqi (2009:63), 'nominal compounding is an application of morphological merger that targets a root and the feature [n] and adjoins them'.[4] The basic structure of compound in this analysis is in 30 below.

(30)   Siddiqi (2009) Style Structure of *coat-rack*
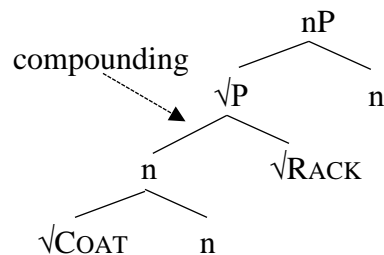
Siddiqi (2009:59) posits that '[i]f nominal compounds are the result of an application of morphological merger to two adjacent heads where one is a root and the other bears the feature [n] we can see why regular inflection is blocked in forms like *rats-infested… [since] the feature [n] is imbedded below the inflection'. An illustration of this is seen in 31 below where the intervention of Num in Siddiqi's structure prevents compounding from occurring.

---

[4] See also Josefsson (1998) for adjunction-based approach to compounding within Distributed Morphology.

(31)   Siddiqi (2009) Style Structure of *rats-infested*
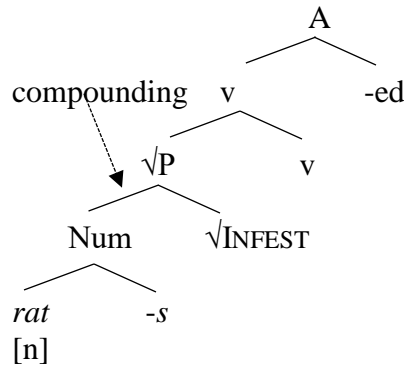
(Siddiqi 2009:59)

Irregular forms are able to participate in compounding because the root, *n*, and Num fuse prior to merger. An example of the structure of a licit plural compound form is in 32. There, the node containing the root *lice* has fused with [n] and [plural] prior to the merger process that produces the compound. This fusion eliminates Num from the structure and allows the merger to proceed.

(32)   Siddiqi (2009) Style Structure of *lice-infested*

Node contains: √LICE, [n], [PLURAL]
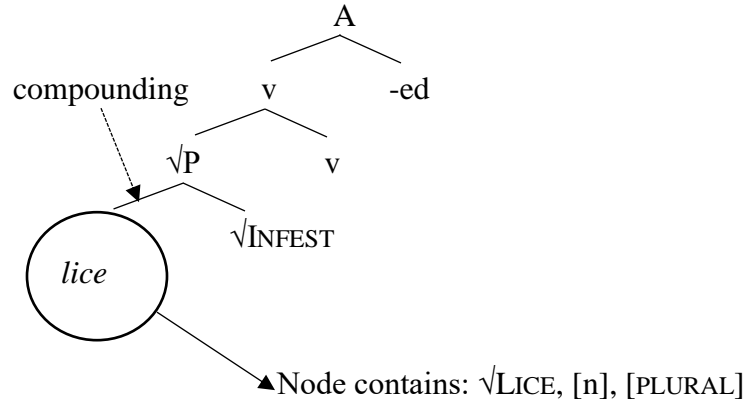
(Siddiqi 2009:60)

In Siddiqi's general framework, irregular forms are stored as separate vocabulary items and part of the competition at Vocabulary Insertion with regular ones. This allows Siddiqi to eliminate readjustment rules. However, this has consequences for the present discussion.

Others have noted that the fusion required generally in Siddiqi 2009 is not truly constrained (cf. Haugen & Siddiqi 2013 and Alexiadou 2016). Further, as noted in Punske 2016a, this analysis requires that the *parks* in *parks department* be stored wholly and separately from the forms *park* and *–s* that are found elsewhere in English for the fusion analysis of the plural of *parks* in *parks*

department to obtain within Siddiqi's assumptions. Beyond running counter to the aggressively decompositional underpinnings of Distributed Morphology, this analysis fails to provide any form of explanatory adequacy; under these assumptions, regular plurals are acceptable if they are stored in the lexicon and one can determine if a regular plural is stored if it can be found as a modifier to a compound.

The present analysis generally avoids such circularity. In our analysis, modifiers with regular or irregular morphology are constrained in identical ways—through selectional properties of the root. This is established through the complement relationship found in Harley 2009 and Jackson & Punske 2013. The selectional properties of the present analysis also account for why forms like *teethbrush* is ill-formed, which has no obvious account in Siddiqi's (2009) proposal.

Wiltschko (2008) develops an account distinguishing the behavior of plural in English and Halkomelem. In this analysis, English plural 'is a functional head that selects for *n*…' (Wiltschko 2008:675). In contrast, Halkomelem plural is a root-level modifier. The relevant structures are provided in 33 and 34 below.

(33)   Wiltschko's (2008) English structure
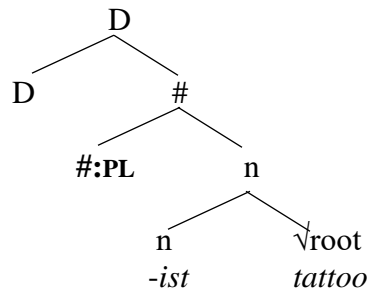
(Wiltschko 2008:675)

(34)   Wiltschko's (2008) Halkomelem structure
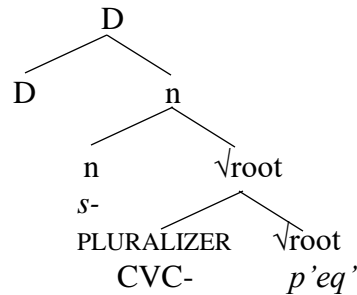
(Wiltschko 2008:675)

Wiltschko (2008:644) bases this analysis on the assumption that 'in English, plural marking is prohibited inside of compounds'. She argues that examples of plural marking on modifiers in English compounds are actually examples of phrasal compoundhood:

(35)   the Charles-and-Di syndrome, over-the-fence gossip, God-is-dead theology, a seat-of-the-

pants executive, a who's-the-boss-wink

(Lieber 1992, cited in Pinker 1999:183, cited in Wiltschko 2008:677)

She further speculates that instances of irregular plural marking on modifiers occur in English compounds because they are more easily reanalyzed.

We believe that this approach cannot account for the systematicity of plural modification discussed throughout. A full discussion of phrasal compounding is beyond the scope of the present work (see Hoeksema 1988 and Lieber 1992 along with other works cited throughout). However, as noted in Ackema & Neelman (2004) and Harley (2009) (among others) phrases that appear as part of a phrasal compound may typically also participate in other word-level morphological operations (see Carnie 2000 for a potential analysis of these facts).

We can compare the examples 36-38 modified from Harley (2009:142-143) which involve phrasal compounding and phrasal word formation to those in 39-44 which involve plural compounding but disallow the same word formation strategizes. If plural modification were phrasal modification these results would be unexpected:

(36)   bikini-girls-in-trouble genre

(37)   the bikini-girls-in-trouble-ness of it all

(38)   it's a bit too bikini-girls-in-trouble-y for me

(39)   mice-infestation

(40)   *the mice-ness of it all

(41)   *?it's a bit too mice-y for me

(42)   rats lab

(43)   *the rats-ness of it all

(44)   *it's a bit too rats-y for me

Much like a lexical-based approach, the phrasal compound approach expects a much higher degree of variability across the system, while the selectional-based approach argued for here appears much better equipped to deal with the compounding facts.

An additional empirical argument is that both Siddiqi's and Wiltschko's accounts struggle to explain why *rats lab* is an acceptable plural in English. For Siddiqi, *rats* would need to be stored as an independent, whole form—but one that is not allowed to surface with roots like *infest* or *trap* for reasons that not apparent from the fusion analysis. For Wiltschko *rats* would be need to be reanalyzed as a phrasal compound only when with *lab* but not with *infest* or *trap.* Both accounts fall under the same type of criticism that Lieber & Scalise (2006) offer of Bresnan & Mchombo's (1995) account of phrasal compounds. In Bresnan & Mchombo 1995, they require phrases to be 'innovatively lexicalized' (Lieber & Scalise 2006:11). Although the theoretic underpinnings are quite different, such requirements are effectively the same.

However, our overall analysis is largely consistent with the rest of Wiltschko's (2008) analysis. We too require a higher functional Num projection for English. We depart from Wiltschko in that our analysis allows lower number modification (similar to her analysis of Halkomelem in 34) in English as well. This, when combined with the selectional account, can capture the distribution of English plural modification in compounds.

5 Conclusions

The present analysis is essentially a synthesis of two pre-existing analyses: compounding by incorporation and a bifurcated plural in the structure of nominals. With this combined analysis we can account for more of the empirical distribution of plurals on modifiers in English compounds than previous accounts, and more elegantly. We argue that there is no general ban on plural modifiers in compounds, but instead a ban on the individuation feature associated with the higher Num projection. This ban emerges as a straightforward outcome of the analysis following Harley (2009) and Jackson & Punske (2013) that the incorporation process of compounding targets a derivational phase, namely nP.

Other bans of specific forms such as *teethbrush* or *pant pocket* find an explanation in the ability of the head root of the compound to select for or against plural features in the modifier,

because the root and the modifier stand in a head-complement relation. The role of selection in these cases provides the mechanism for 'lexicalization' of preferences for certain forms. Crucially, roots are unable to select for individuated plurals, because of the structural ban on incorporation of the higher Num phrase. Thus, our account has the happy consequence of allowing some form of lexicalization, which appears appropriate given the data, but placing a clear constraint on how far this lexicalization can go. This constraint is borne out empirically, and it emerges as simply a natural consequence of our analysis.

Going beyond the consideration of English, we take the stance that Kramer's (2016) structure is universal and that linguistic variation is due to different featural specifications of the Num and *n* across languages. Thus, the feature [INDV] is associated with the position Num in English in 45 below, but each language may vary in the particular contentful features associated.

(45)   Universal number spine

    NumP
   /\
Num   *n*P   = Allosemy possible
   /\
  n   √
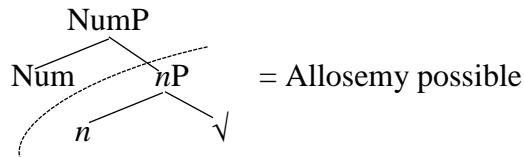
A generalized prediction of our account is that features in the higher Num cannot trigger allosemy on the root, in any language, because it is outside the cyclic domain. For English, this analysis predicts that an individuated plural should never trigger allosemy on a root. For other languages, there may be different features in the Num position, which may result in different restrictions on when allosemy is possible. For example, if no plural feature can associate with *n*, but only with Num, this would predict a total ban both on allosemy of plurals and plural forms in the modifier element of compounds.

Ultimately, we believe that one of the primary strengths of this analysis is the fact that the explanation of this recalcitrant pattern of data emerges from a straightforward synthesis of Jackson & Punske 2013 and Kramer 2016 (and others), with no additional machinery beyond the combination of assumptions. We take this to be good evidence that both of these lines of work are on the right path, and should continue to provide useful insights into the structure of nominals.

REFERENCES

ACKEMA, PETER; AND AD NEELEMAN. 2004. *Beyond morphology: Interface conditions on word formation.* Oxford: Oxford University Press.

ADAMSON, LUKE. 2017. On locality conditions for contextual allosemy: Gender and number. Poster Presentation at *the 91st Annual Meeting of the Linguistics Society of America.* Austin, TX. January, 6, 2017.

ADGER, DAVID. 2007. Stress and phrasal syntax. *Linguistic Analysis* 33: 238-266.

ALEXIADOU, ARTEMIS. 2011. Plural mass nouns and the morpho-syntax of number. *Proceedings of the 28th West Coast Conference on Formal Linguistics*, ed. by Mary Byram Washburn, Katherine McKinney-Bock, Erika Varis, Ann Sawyer, and Barbara Tomaszewicz. Somerville, MA: Cascadilla Press. 33-41.

ALEXIADOU, ARTEMIS. 2016. Building words. *Morphological metatheory,* ed. by Daniel Siddiqi and Heidi Harley. Amsterdam: John Benjamins Publishing. 223-236.

ACQUAVIVA, PAOLO. 2004. Constraining inherent inflection: Number and nominal aspect. *Folia Linguistica* 38: 333-354.

ACQUAVIVA, PAOLO. 2014. The roots of nominality, the nominality of roots. *The syntax of roots and the roots of syntax,* ed. by Artemis Alexiadou, Hagit Borer, and Florian Schäfer. Oxford: Oxford University Press. 33-56.

ACQUAVIVA, PAOLO. 2016. Linguistic plurality and the conceptualization of part structure. *Unity and plurality: Logic, philosophy, and linguistics,* ed. by Massimiliano Carrara, Alexandra Arapinis, and Friederike Moltmann. Oxford: Oxford University Press. 194-218.

BAKER, MARK. 1988. *Incorporation: A theory of grammatical function changing.* Chicago: University of Chicago Press.

BOBALJIK, JONATHAN. 2012. *Universals in comparative morphology: Suppletion, superlatives, and the structure of words.* The MIT Press: Cambridge, MA.

BORER, HAGIT. 2005. *Structuring Sense.* Oxford: Oxford University Press.

BRESNAN, JOAN; AND SAM MCHOMBO. 1995. The Lexical Integrity Principle: Evidence from Bantu. *Natural Language and Linguistic Theory* 13: 181-254.

CARNIE, ANDREW. 2000. On the notions of XP and X^0. *Syntax* 3: 59-106.

CHOMKSY, NOAM. 2000. Minimalist inquiries: the framework. *Step by Step: Essays on Minimalist syntax in honor of Howard Lasnik,* ed. by Roger Martin, David Michaels, and Juan Uriagereka. Cambridge, MA: MIT Press. 89-155.

CHOMKSY, NOAM. 2001. Derivation by phase. *Ken Hale: a life in language,* ed. by Michael Kenstowicz. Cambridge, MA: MIT Press. 1-52.

CHOMKSY, NOAM. 2008. On phases. *Foundational issues in linguistic theory: essays in honor of Jean-Roger Vergnaud,* ed. by María-Luísa Zubizarreta, Robert Friedin, and Carlos P. Otero. Cambridge, MA: MIT Press. 133-166.

DOBASHI, YOSHIHITO. 2003. *Phonological phrasing and syntactic derivation.* Ithaca, NY: Cornell University dissertation.

EMBICK, DAVID. 2010. *Localism versus globalism in morphology and phonology.* The MIT Press: Cambridge, MA.

GORDON, PETER. 1984. Of mice-eaters and men-eaters: Level ordering in young lexicons. Ms. MIT.

GORDON, PETER. 1985. Level-ordering in lexical development. *Cognition* 21: 73-93.

HAMMOND, MICHAEL. 1984. Level ordering, inflection and the Righthand Head Rule. *MIT Working Papers in Linguistics volume 7*, ed. by Margaret Speas and Richard Sproat. Cambridge, MA: MIT Press.

HARLEY, HEIDI. 2009. Compounding in Distributed Morphology. *The Oxford Handbook of Compounding*, ed. by Rochelle Liber and Pavol Štekauer. Oxford: Oxford University Press. 129-144.

HARLEY, HARLEY; and MEGAN STONE. 2013. The 'No Agent Idioms' hypothesis. *Syntax and its Limits*, ed. by Raffaella Folli, Christina Sevdali, and Robert Truswell, Oxford: Oxford University Press.

HARWOOD, WILLIAM. 2013. *Being progressive is just a phase: dividing the functional hierarchy*. Universiteit Gent doctoral dissertation.

HAUGEN, JASON; and DANIEL SIDDIQI. 2013. Roots and the derivation. *Linguistic Inquiry* 44: 493-517.

HOEKSEMA, JACK. 1988. Head-types in morpho-syntax. *Yearbook of morphology 1988*, ed. by Geert Booij and Jaap van Marle

ISHIHARA, SHINICHIRO. 2007. Major phrase, focus intonation, multiple spell-out. *The Linguistic Review* 24: 137-167.

JACKSON, SCOTT. 2007. *Information, truth, structure, and sound.* Tucson, AZ: University of Arizona dissertation.

JACKSON, SCOTT; and JEFFREY PUNSKE. 2013. Deriving English compound stress: insights from Distributed Morphology and multiple spell-out. *Linguistic Analysis* 38: 243-274

JOSEFSSON, GUNLÖG. 1998. *Minimal words in a minimal syntax: Word formation in Swedish*. Amsterdam: John Benjamins Publishing Company.

KAHNEMUYIPOUR, ARSLAN. 2009. *The syntax of sentential stress.* Oxford: University of Oxford Press.

KIPARSKY, PAUL. 1982. From Cyclic Phonology to Lexical Phonology. *The Structure of Phonological Representations: Part I*, ed. by Harry van der Hulst and Norval Smith. Dordrecht: Foris. 131-175.

KRAMER, RUTH. 2012. A split analysis of plurality: evidence from Amharic. *Proceedings of the 30th West Coast Conference on Formal Linguistics*, ed. by Nathan Arnett and Ryan Bennett. Somerville, MA: Cascadilla Proceedings Project. 226-236.

KRAMER, RUTH. 2016. A split analysis of plurality: Number in Amharic. *Linguistic Inquiry* 47: 527-559.

KRATZER, ANGELIKA; and ELISABETH SELKIRK. 2007. Phase theory and prosodic spellout: The case of verbs. *The Linguistic Review* 24: 93–135.

LECARME, JACQUELINE. 2002. Gender 'polarity:' theoretical aspects of Somali nominal morphology. *Many Morphologies*, ed. by Paul Boucher and Marc Plénat. Somerville, MA: Cascadilla Press. 109-141.

LEGATE, JULIE ANN. 2003. Some interface properties of the phase. *Linguistic Inquiry* 34: 506-515.

LIEBER, ROCHELLE. 1992. *Deconstructing morphology: word formation in syntactic theory.* Chicago: University of Chicago Press.

LIEBER, ROCHELLE; AND SERGIO SCALISE. 2006. The Lexical Integrity Hypothesis in a new theoretical universe. *Lingue e Linguaggio* 5: 7-32.

LOWENSTAMM, JEAN. 2008. On little n, √, and types of nouns. *Sounds of Silence: Empty Elements in Syntax and Phonology*, ed. by Jutta Hartmann, Veronika Hegedűs, and Henk van Riemsdijk. Amsterdam: Elsevier. 105-144.

MATHIEU, ERIC. 2012. On the mass/count distinction in Ojibwe. *Count and mass across languages,* ed. by Diane Massam. Oxford: Oxford University Press: 172-198.

MATHIEU, ERIC. 2014. Many a plural. *Weak referentiality*, ed. by Ana Aguilar-Guevara, Bert Le Bruyn and Joost Zwarts. Amsterdam: John Benjaimins Publishing Company. 157-182.

MERCHANT, JASON. 2015. How much context is enough? Two cases of span-conditioned stem allomorphy. *Linguistic Inquiry* 46: 273-303.

PINKER, STEPHEN. 1999. *Words and rules: the ingredients of language.* New York: Basic Books.

PUNSKE, JEFFREY. 2016a. Compounding. *Language and Linguistics Compass* 10: 382-393.

PUNSKE, JEFFREY. 2016b. Cyclicity versus movement: English nominalization and syntactic approaches to morpho-phonological regularity. *Canadian Journal of Linguistics* 61: 68-97.

RICHARDS, NORVIN. 2010. *Uttering trees.* The MIT Press: Cambridge, MA.

RITTER, ELIZABETH; and MARTINA WILTSCHKO. 2009. Varieties of INFL: TENSE, LOCATION and PERSON. *Alternatives to cartography,* ed. by Jeroen van Craenenbroeck. Berlin: Mouton de Gruyter.

RITTER, ELIZABETH; and MARTINA WILTSCHKO. 2014. The composition of INFL: An exploration of *tense, tenseless* languages, and *tenseless* constructions. *Natural Language and Linguistic Theory* 32: 1331-1386.

SAMUELS, BRIDGET. 2009. *The structure of phonological theory.* Cambridge, MA: Harvard University dissertation.

SATO, YASUKO. 2009. Spelling out prosodic domains: a multiple spell-out account. *InterPhases: Phase-theoretic investigations of linguistic interfaces*, ed. by Kleanthes Grohmann. Oxford: Oxford University Press. 234-259.

SELKIRK, ELISABETH. 1982. *The syntax of words.* The MIT Press: Cambridge, MA.

SIDDIQI, DANIEL. 2009. *Syntax within the word: Economy, allomorphy, and argument selection in Distributed Morphology*. Amsterdam: John Benjamins Publishing Company.

SPROAT, RICHARD. 1985. *On deriving the lexicon.* Cambridge, MA: MIT dissertation

SVENONIUS, PETER. 2005. Extending the extension condition to discontinuous idioms. *Linguistic Variation Yearbook* 5: 227-263

THOMAS-FLINDERS, TRACY. 1983. *Morphological structures.* Los Angeles: UCLA dissertation.

WEXLER, PAUL. 2002. *Two-tiered relexification in Yiddish: Jews, Sorbs, Khazars, and the Kiev-Polessian Dialect*. Berlin: Mouton de Gruyter.

WILTSCHKO, MARTINA. 2008. The syntax of non-inflectional plural marking. *Natural Language and Linguistic Theory* 26: 639-694.

WILTSCHKO, MARTINA. 2009a. √Root incorporation: Evidence from lexical suffixes in Halkomelem Salish. *Lingua* 119: 199-223.

WILTSCHKO, MARTINA. 2009b. What's in a determiner and how did it get there? *Determiners: Universals and variation,* ed. by Jila Ghomeshi, Ileana Paul, and Martina Wiltschko.