

# The Ins and Outs of Contextual Allomorphy

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## Abstract

This paper investigates the configurations in which one morpheme (or the features it expresses) may serve as the context triggering allomorphy of another morpheme. It is argued, in part contra Carstairs 1987, that a given morpheme may be sensitive either *inwards* or *outwards* (i.e., to a morpheme closer to or farther from the root), but that the different directions reflect sensitivity to different types of morphological features, particularly among non-adjacent morphemes. Special attention is paid to allomorphy in the highly complex agreement systems of the Chukotko-Kamchatkan languages. Finally, it is shown that the particular constellation of asymmetries in the allomorphy investigated follows straightforwardly from certain assumptions about the architecture of the grammar and the nature of morphology, key among which being (i) separation/late-insertion: the phonological strings we call affixes are reflections of prior, abstract derivations—morphology interprets syntactic structures, rather than feeding them, (ii) cyclicity: that this interpretive procedure (*vocabulary insertion*) proceeds root-outwards, and (iii) rewriting: that as morphosyntactic features are *expressed* by vocabulary items, those features are *used up* and no longer a part of the representation.

## Introduction

An observation fundamental to theories of morphology is that words have complex structure; they are (often) built up of separate, identifiable pieces—*morphemes* in a loose sense of the word. It is clear, moreover, that these pieces, to the extent they can be said to be discrete, interact with one another in complex ways. Often, the shape of one morpheme is determined in part by the context in which it occurs, i.e. by its neighbouring morphemes (or by properties they express). An important question in the study of such *contextual* allomorphy is:

- (1) Under what conditions may one morpheme (M1) condition allomorphy for (including the appearance or absence of) another morpheme (M2)?

A partial answer to this question is offered by the hypothesis of cyclicity in morphology, i.e., the premise that the surface form of a complex word is derived sequentially, from the most deeply embedded constituent outwards. This hypothesis, famously prominent in Lexical Morphology, is shared by many approaches to morphology cutting across major theoretical divisions; thus it is held by proponents of strictly concatenative (Item and Arrangement) theories and strictly rule-based theories (Word-Formation Rules, A-Morphous Morphology), and is found in pre-syntactic (Lexicalist) as well as post-syntactic (Realizational) approaches. A significant component of the cyclicity hypothesis is that it derives some form of No Lookahead Condition. (e.g., Simpson & Withgott 1986:155). To take their example, the derivation of the English word *cliticization* [[[ clitic ] iz(e) ] ation ] proceeds in steps, adding *-ize* to the stem *clitic* on the first cycle, and adding *-ation* to the result on a second cycle. In the first cycle,

when *-ize* is added, information is available about the stem (e.g., that it is a noun), and hence this may constrain the process (for example, triggering allomorphy). However, no information is available about what *will* happen in the second cycle: thus information about the more peripheral suffix may not condition processes such as allomorphy for the first suffix. To do so would involve “looking ahead” to a subsequent cycle. In other words, as the complex word is constructed, one condition on allomorphy for a given affix is that it may only be sensitive to information already present in the morphological structure at the time that affix is added.

Cursory inspection of a range of languages shows that No Lookahead in an absolute form is too strong.<sup>1</sup> There are many cases in which the choice of allomorph for a particular morpheme is conditioned by morphemes or features further out. Stem-allomorphy is such a case (almost) by definition, but there are also cases in which one affix is sensitive to (features of) a more peripheral affix, what Carstairs 1987 has called *outwards-sensitivity*. While there is good evidence that No Lookahead applies in some cases, an answer to question (1) must also give an account of where and in what manner No Lookahead must be weakened. In discussing this, Carstairs-McCarthy 1992:214 observes that:

“It is as if inflectional realisation operates on the basis of precise information about what has already been spelled out (subject perhaps to ‘forgetting’ some material that is no longer ‘adjacent’), but only vague information about what has yet to be spelled out.”

Importantly, Carstairs-McCarthy notes that an answer to (1) is only part of a theory of morphology. The deeper challenge is to answer the question (2):

(2) Given that contextual allomorphy is subject to a certain set of constraints, *why* is it subject to *precisely those* constraints?

While the first question is one of description, it is in posing this second question that explanation is sought in morphological theory. By reducing empirical generalizations (such as *No Lookahead* or Carstairs 1987’s *Peripherality Constraint*) to deeper principles of the grammar (such as *cyclicity*) we move that much closer to uncovering the answers to question (2).

In this paper, I seek to explore the issue of contextual allomorphy in these terms. The starting point is an examination of the complex agreement system of Itelmen, a Chukotko-Kamchatkan language (Section 1). In this section, I propose a precise characterization of exactly what “vague information” may escape the No Lookahead Condition. Specifically, I argue that allomorphy conditioned by more peripheral morphemes/features is only sensitive to morpho-**syntactic** (i.e., syntactically relevant) features (such as tense and agreement). This is in opposition to inwards-sensitive

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<sup>1</sup> Indeed, Simpson & Withgott 1986 propose that their No-Lookahead Condition holds only of “layered” (compositional) morphology, but not of “templatic” morphology (on the distinction see also Muysken 1986).

allomorphy, which is conditioned by morpho-(**phono**-)logical features such as class marking and other (syntactically irrelevant) diacritics. In other words, I argue that there is not a vagueness but a systematicity to the asymmetries observed in inflectional allomorphy.

In section 2, I turn to the deeper question of why this particular division is the way it is. I demonstrate that the observed patterns of sensitivities follow directly from a model of morphology that encompasses the assumptions in (3) (see section 2 for elaboration).

(3) Some Key Assumptions:

- separation: morphology interprets syntactic structures, rather than feeding them,
- cyclicity: this interpretive procedure (*vocabulary insertion*) proceeds root-outwards, and
- rewriting: as morphosyntactic features are *expressed* by vocabulary items, these features are *used up* and no longer a part of the representation.

In a nutshell, I contend that the combination of *separation* (or “Late Insertion”) and *cyclicity* derives exactly the weakening of the No Lookahead Condition that corresponds to the observed patterns in the data, i.e., a relativization of this condition to particular types of features. The third assumption will derive the observation that allomorphy conditioned by (syntactic) features such as agreement is attested (arguably) only when the features in question are more peripheral. All three assumptions are well-known (if controversial) in the literature and find independent support from domains beyond inflectional allomorphy. As far as I can tell, though, any framework which does not share these assumptions (in particular those positing flat structures or looser domains for contextual allomorphy) must treat the systematic asymmetries in the Chukotko-Kamchatkan data as mere accidents, having no principled (synchronic) account. Among current frameworks, the theory of Distributed Morphology (see Halle & Marantz 1993, henceforth DM) explicitly maintains the first two assumptions and readily accommodates the third (see Halle 1990). This paper may then be taken as support for a DM-like framework as against those frameworks which reject one or more of the assumptions in (3).

Explaining empirical generalizations requires of course establishing the validity of those generalizations. In sections 3-4 I consider various *prima facie* counter examples to the generalizations proposed in section 1. Potentially relevant examples are attested and I do not pretend to address all, nor am I able to offer sufficient detail to consider some of the remarks in these sections to be more than tentative. In particular, section 4 addresses only some of the examples underlying the *Peripherality Constraint* of Carstairs 1987, which excludes outwards-sensitivity of exactly the sort proposed here, though in one case, I offer evidence that the alternations in question do not in fact involve allomorphy and hence are not of obvious relevance to the issue at hand. My aim in this paper is not to establish the validity of the generalizations I propose, nor the theory from which they derive, beyond a doubt. Rather, I hope to demonstrate the initial plausibility of the generalizations in terms as explicit as possible, and to show how they derive directly from the constellation of assumptions in (3). To the extent that the logic is consistent,

then I will have provided a means for testing this constellation of assumptions: they are accurately combined only to the extent that the generalizations which they derive are true. Brief concluding remarks are offered in section 5.

### 1 Itelmen Agreement: Outwards-Sensitive Allomorphy

The inflected transitive verb in the Chukotko-Kamchatkan languages of Russia's Bering Sea coast<sup>2</sup> shows agreement simultaneously both with subject and with one object (or oblique). This agreement is expressed by a combination of prefix and suffixes, occurring peripheral to any other affixes the verb may have (mood, tense, aspect, derivational affixes, etc.) as illustrated in (4).<sup>3,4</sup>

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<sup>2</sup> These are: Itelmen (formerly called "Kamchadal"), Koryak, Alutor, Kerek and Chukchi. We will only consider Itelmen and Chukchi here, taking the latter to be representative of the four Northern C-K languages. To be sure, there are differences among these four languages, but they do not directly bear on the issue at hand. For example, Koryak and Alutor distinguish dual and plural, and the Alutor pluraliser *-wwi* shows a slightly different distribution from that of the Chukchi pluraliser *-((ni)ne)t* (see especially Mel'čuk 1986, 1988). There are also differences in the tense/aspect system and the environments which require inverse marking (Spencer 1996, Halle & Hale 1997) among the languages. The precise nature of the relationship of Itelmen to the other languages is unclear, though the overwhelming similarities in the inflectional morphology under consideration provide one of the strongest arguments for the relationship (Comrie 1983).

<sup>3</sup> Abbreviations used throughout: 1,2,3 = 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> person; SG,PL = singular, plural; SU,OB,IO = subject, object, indirect object, thus: 1S:SU = 1<sup>st</sup> person singular subject, etc.; ABS = absolutive, AGR = agreement, AOR = aorist, ASP = aspect, DAT = dative, ERG = ergative, FUT = future, IMP = impersonal, IRR = irrealis, LOC = locative, PEJOR = pejorative, POSS = possessive, PRES = present, sth. = 'something', TNS = tense, TRANS = transitive.

<sup>4</sup> The Itelmen examples are primarily from field notes, supplemented by Volodin 1976 [=VOL]; Chukchi data is from Skorik 1977 [=SKOR] (except as noted) with glosses translated or supplemented by me. Itelmen data is given in a broad transcription, following IPA (thus C' = ejective consonant) with the following exceptions: č = [tʃ]; s, z are apical, post-alveolar fricatives; ʔn, ʔl, ʔm represent glottalized consonants. Predictable secondary articulations (e.g., non-phonemic palatalization) are omitted, but phonological allomorphy (such as the voicing alternation in the present tense marker) is indicated.

Of three major dialects of Itelmen attested in the eighteenth century, only (two sub-dialects of) the Western variety survives, spoken currently by fewer than 50 people on the central Okhotsk coast of the Kamchatka peninsula. For consistency, most examples in this paper are from the Sedanka (Northern) sub-dialect. There are no differences (that I am aware of) between the dialects affecting the points made in this paper, and with appropriate phonological and morphological adjustments, parallel examples could be provided for the Southern (Khairiuzovo) sub-dialect. More detailed treatment of some of the material presented here is to be found in Bobaljik & Wurmbrand 1997 and Bobaljik 1998, and more general information can be found in the monograph length grammars of Itelmen: Volodin 1976 and Georg & Volodin 1999.

- (4) Transitive verbs:
- |    |                     |            |
|----|---------------------|------------|
| a. | t' – əlčqu – (ɣ)in. | (Itelmen)  |
|    | 1S:SU-see-2S:OB     |            |
|    | 'I saw you'         | [S1:71]    |
| b. | tə – ʔʉu – ɣət.     | (Chukchi)  |
|    | 1S:SU-see-2S:OB     |            |
|    | 'I saw you'         | [SKOR: 44] |

The prefix (sometimes null) and suffix are likewise both obligatory with intransitive verbs, as illustrated in (5), though here both prefix and suffix reference the features of the subject.<sup>5</sup>

- (5) Intransitive verbs:
- |    |                          |            |
|----|--------------------------|------------|
| a. | t – k'ot – k(ičen).      | (Itelmen)  |
|    | 1S:SU-come-1S:SU         |            |
|    | 'I came'                 | [S3:13]    |
| b. | tə – kətɣəntat – (ɣʔa)k. | (Chukchi)  |
|    | 1S:SU-run-1S:SU          |            |
|    | 'I ran'                  | [SKOR: 20] |

Combining the examples, the general schema of the Chukotko-Kamchatkan verb is that in (6). Here “object” may refer to either direct or indirect object—a given verb may agree with either one, but not both. Factors influencing the decision are discussed in Bobaljik & Wurmbrand 1997.

- (6) AGREEMENT-(stuff)-verb.stem-(stuff)- AGREEMENT [stuff= {MOOD} ... {TNS,ASP}]  
 Subject Subject/Object

Analysis of the verbal agreement patterns in these languages is the subject of Bobaljik & Wurmbrand 1997 (Itelmen), extended to Chukchi in Bobaljik 1998. The conclusion of those studies which bears most centrally on the present discussion is the proposal that the agreement system is fundamentally aligned in terms of subject versus object, and that the prefix is the “primary exponent” (in the sense of Carstairs 1987) of subject agreement while the suffix is the primary exponent of object agreement. Apparent instances of subject agreement in the suffixes including those in (5) arise from a process akin to allomorphy. In essence, the claim is that the suffixes *agree* with the object, but show allomorphy for (‘sensitivity to’) features of the subject. The crucial observation is that this allomorphy is systematically asymmetrical: while the correct choice of suffix is in certain well-defined instances dependant on features canonically expressed by the prefix, the choice of prefix is (essentially) never sensitive to properties of the suffix (i.e.,

<sup>5</sup> Intransitive verbs (those with no direct object) may agree with a benefactive, goal or other dative argument. See Bogoras 1922, Volodin 1976 and Bobaljik & Wurmbrand 1997 for examples and discussion.

object). In what follows, I will quickly summarize the main points of Bobaljik & Wurmbrand 1997 as they bear on the current discussion, referring the reader to the references cited for further details.

**1.1 Itelmen Agreement in a Nutshell** As (4)-(5) illustrate, the choice of prefix is determined by the person and number of the subject (and mood), while the features reflected in the suffix position are those of the object of transitive verbs, but of the subject of intransitive verbs. This curious situation, which occurs in all of the Chukotko-Kamchatkan languages, has been described as a unique type of ergative split by e.g., Comrie 1981:247 and Spencer 1996:1—nominative-(accusative) prefixes co-occurring with (ergative)-absolutive suffixes.<sup>6</sup>

Bobaljik & Wurmbrand 1997 argue that this “ergative split” in Itelmen is epiphenomenal and that the entire agreement system is fundamentally aligned in terms of subject versus object, with subject agreement in the suffix being secondary.<sup>7</sup> The prefixes are indeed clearly subject-oriented and do not (with one exception) distinguish between transitive and intransitive subjects (e.g., *t-* ↔ [1.SG.SU (realis)]). This is the canonical NOMINATIVE grouping. However, the suffixes show a much more complex pattern. For one thing, the suffix may agree with an indirect (DATIVE) object and fail to agree with the ABSOLUTIVE (Volodin 1984, Bobaljik & Wurmbrand 1997). More tellingly, Volodin & Vakhtin 1986 observe that despite the apparent alignment of the suffix position along ABSOLUTIVE lines (grouping together intransitive subject and transitive object, to the exclusion of transitive subjects), there are no truly ABSOLUTIVE suffixes. For instance, the suffix corresponding to a [1:SG:INTRANS:SU =“S”] is *-kičen*, while that corresponding to a [1:SG:OB =“O”] is *-βum*. The unity of transitive (=“A”) and intransitive (=“S”) subject prefixes, and the lack of a corresponding unity of intransitive subject and object suffixes, is quite general as can be seen from the relatively complete paradigm in (7).<sup>8</sup>

<sup>6</sup> Note that in Itelmen, direct arguments—subject and object—do not bear any case marking. This contrasts with the other C-K languages which have an ergative-absolutive case system.

<sup>7</sup> Fortescue 1997 reaches a similar conclusion from a diachronic perspective.

<sup>8</sup> A small number of transitive verbs take “Class II” conjugation, which involves an additional morpheme typically occurring before the agreement suffixes in this table. This is the focus of section 1.2 below. There are two ways in which the data in the table deviates from the general characterization given in the text. First, the suffix *-sx* occurs with all [2PL] subjects—the only instance of true suffixal agreement with a transitive subject. Note, though, that *-sx* occurs peripheral to the other suffixal agreement morphology, e.g., *q-tϕli-xk-um-sx* [2:SU-bring-CLASSII-1S:OB-2P:SU] and is strange within C-K morphology in other ways as well. Second, the prefix for a [3PL] subject varies for transitivity (*n-~∅*). See note 10. This contrasts sharply with the situation in Chukchi, Alutor and Koryak, as discussed below.

(7)

ITELMEN AGREEMENT (CLASS I)			
person-number	A	S	O
1sg. REAL	t-	t- -kičɛn	-βum
IRREAL	m-	m- -kičɛn	
2sg. R		-č	-[ɣ]in
I	q-	q- -xč	
3sg. R		-n	[see below]
I	xɐn-	xɐn- -n	
1pl. R	nt-	nt- -kičɛʔn	-βuʔm
I	mən-	mən- -kičɛʔn	
2pl. R	-sX	-sX	-sxɛn
I	q- -sX	q- -sX	
3pl. R	n-	-ʔn	[see below]
I	xɐn-	xɐn- -ʔn	

Note that for 1<sup>st</sup> and 2<sup>nd</sup> person objects, the features of the object alone control the agreement suffix. With 3<sup>rd</sup> person direct objects (8), the situation is more complex in that the form of the suffix expresses the number of the object (i.e. by the glottalization of “n,” or a glottalized “n”—written *ʔn*—the regular plural throughout the language) but is simultaneously conditioned by the (person, number) features of the subject.

(8)

ITELMEN AGREEMENT: 3 PERSON DO		
SUBJECT	DIRECT OBJECT	
	3sg	3pl
1sg, pl IMPERSONAL	-čɛn	-čɛʔn
2sg REAL	-(i)n	-(i)ʔn
IRREAL	-x(č)	-(x)iʔn
2pl	-sX	-sxiʔn
3sg, pl	-nen	-neʔn

Bobaljik & Wurmbrand 1997 observe that the correct generalization to be made here is this: the agreement suffix in Itelmen is determined by the person and number features of the object when it has such features. When the object does not have the appropriate features, then the features of the subject are coopted. This gives rise to the apparent double expression of subject agreement in intransitive verbs as in (5); the prefix is true subject agreement, but the suffix reflects the person and number features of the subject only due to the fact that there is no object to contribute these features. The corroborating evidence for an analysis along these lines comes from the forms in (8). On the not unfamiliar assumption that 3<sup>rd</sup> “person” objects lack person features, but have number (cf. Benveniste 1956, Forschheimer 1953, Ritter 1995, Noyer 1997), we see these as

evidencing a split: the number features of the suffix are contributed by the object, while the person features reflect those of the subject.<sup>9</sup>

An important aspect of the account sketched above is that it displays an asymmetry. The choice of suffix depends in certain instances (intransitives and transitive clauses with 3<sup>rd</sup> person direct objects) on features expressed by the prefix (i.e., subject person and number), but the choice of prefix never depends on features expressed by the suffix (i.e., object person and number).<sup>10</sup> As the Itelmen examples involve interaction between a prefix and a suffix it is not a priori clear whether this sensitivity is inwards or outwards.<sup>11</sup> However, by looking further into Itelmen morphology, it is possible to construct an (indirect) argument that this contextual allomorphy conditioned by agreement features is uniquely outwards. The argument comes from an examination of the allomorphy of the marker of the second conjugation class.

**1.2 The Implications of Class** Transitive verbs in Itelmen fall into one of two conjugation classes. Class I (by far the largest) is unmarked, while Class II is marked in all forms by a suffix which typically precedes the agreement (and non-finite) morphemes, and follows tense and aspect suffixes. Though there is some inter- and intra- speaker variation concerning class membership, Volodin 1976:205 lists 16 verbs as belonging to Class II.<sup>12</sup> Pairs of Class I and Class II verbs are given in (9)-(10). In each pair, the (b)

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<sup>9</sup> This analysis in terms of sharing or copying of features was first introduced for this data in Bobaljik & Wurmbrand 1997. Since then, a number of similar cases have been identified in a range of languages, see, e.g., Fernández & Hale 1999 on K'ichee' and Basque. The "Subject Marking Anomaly" identified for a dialect of Quechua by Weber 1989:97 (brought to my attention by E. Dorgan) may be similar as well; but if so, it is a potential problem for the analysis presented here (see below).

<sup>10</sup> The third person plural indicative prefix alternates between *n-* (transitive) and  $\emptyset$  (intransitive) but even this is not sensitive to the *features* of the object, but only to the presence or absence of an object.

<sup>11</sup> One might also seek phonological evidence of constituency in Itelmen. To the extent there is any evidence either way, the agreement prefixes are more loosely attached to the verb-word than the suffixes are, in the sense that those agreement prefixes containing a vocalic element (1PL and 3PL IRREALIS) escape the otherwise exceptionless generalization that stress falls on the first vocalic element (including schwa) regardless of whether this element is in the stem or in a suffix (as in (9b)). As no other tests seem to reliably distinguish prefixes from suffixes in their phonological behaviour; and as it is moreover clear that there are mismatches between morphological-syntactic structure and phonological structure that must be attributed to phonology, I will not pursue the phonological evidence any further.

<sup>12</sup> There is no apparent syntactic, semantic or phonological coherence to this list; it is simply an arbitrary diacritic. The verbs Volodin lists are: *sxzu-k-es* 'to carry (s.o., s.th.) on one's back', *əntxla-k-es* 'to carry, convey by vehicle [including by horse]', *tʰt-k-es* 'to bring', *k'zi-k-es* 'to grab (s.o.) by the nape of the neck', *ənk-k-es* 'to catch', *əlʔe-k-es* 'to get (s.o., s.th.) from below, beneath the water', *tzil-k-es* 'to catch up to, overtake', *čke-k-es* 'to find', *čaβa-k-es* 'to meet', *χaq til-k-es* 'to recognize, know (s.o.)', *qeze-k-es* 'to welcome, treat (s.o.)', *čel-k-es* 'to choose, elect (s.o.)', *la-k-es* 'to give out (s.o.), betray; to tell (s.th.)', *txiʔ-k-es* 'to remember', *t'k'ne-k-es* 'to press down on, squeeze', and *əmpika-k-es* 'to hit with all one's strength'.



example shows a Class II morpheme (boldfaced) between the present tense morpheme (s/z) and the agreement suffixes, morphemes which are adjacent to one another in the (a) (Class I) examples.

- (9) a. t' – əŋkzu – s – čeʔn (l'eʔku – ʔnɬ – aʔn).  
 1S:SU -help -PRES -1>3P:OB (mouse-pejor-pl)  
 'I'm helping the mice' [KL:17]
- b. t – tɕ – s – **ki** – čeʔn (... č'eβuzlay – aʔn kɬɕl – eʔn).  
 1S:SU -bring -PRES -II -1>3P:OB (... tasty-pl rotten.heads-pl)  
 'I'm bringing tasty rotten (mouse) heads' [KL:25]
- (10) a. əlčqu – z – in (məzin kist)?  
 see -PRES -2S>3S:OB our house  
 'Do you see our house?' [KL:16]
- b. tɕ – s – **čŋ** – in (əŋqa)?  
 bring -PRES -II -2S>3S:OB what  
 'What are you bringing?' [KL:25]

Of immediate relevance is the shape of the Class II morpheme which is different in the two (b) examples. Indeed, there are a range of Class II allomorphs, given with the contexts for their occurrence in (11).

- (11) **Class Markers:** Caveat: some variation exists
- |                       |   |
|-----------------------|---|
|                       | <u>/environment</u>                                 |
| -k-                   | [non finite] (including participles)                |
| -čiq-                 | [3S:SU>3:OB]  |
| (-čŋ-                 | [2S>3:OB/REALIS])                                   |
| -čy <sup>w</sup> (i)- | [3P>3:OB] [2S>3:OB/REALIS] [2S>3P:OB/IRR]           |
| --ik <sup>13</sup>    | [2P>3S:OB] [2S>3S:OB/IRR]                           |
| -xk-                  | [1:OB] [2S:OB] [2P>3P:OB]                           |
| -ki-                  | [2P:OB] [3.IO] [1>3:OB] [∅ >3:OB] i.e. "impersonal" |

It is clear that the choice of allomorph for the Class II marker is determined largely by agreement features (person and number) of both the subject and object. Importantly, like the sensitivity considered in the previous section, this allomorphy is asymmetrical. Quite generally, the Class marking does not influence the choice of agreement suffix or prefix, as can be seen in (9)-(10); other than the phonologically conditioned voicing alternation, the inflectional morphemes underlined in each (a) example are the same as in the corresponding (b) examples. The choice of Class suffix depends on features expressed by the agreement suffix (i.e., object person and number) and prefix (i.e.,

<sup>13</sup> -ik alone among the Class II allomorphs surfaces to the right of the agreement suffixes. Note though that it occurs only with 2<sup>nd</sup> person subjects, which add a range of complications to the pattern described here. See Bobaljik & Wurmbrand 1997: 417ff for some discussion, and Bobaljik 1998:§2.2.1 for a comparison to Chukchi.

subject person and number), but the choice of prefix and object agreement suffix (almost never depends on the feature expressed by the Class suffix (i.e., Class II).<sup>14</sup>

Directing our attention to the two suffixes (class and agreement) we see that we may provide a partial answer to the question posed at the beginning of this section: allomorphy of the Class II morpheme is conditioned by features of the more peripheral object agreement suffix. This sensitivity is asymmetrical (thus “pure” in Carstairs’s terms) and clearly outwards. At this point, we may assume that sensitivity conditioned by agreement features obeys a unique direction of sensitivity, in this case outwards. Since (both) the object agreement suffix (and the class suffix) are conditioned (asymmetrically) by agreement features of the prefix (as discussed in section 1.1), we conclude that the prefix is more peripheral in the word than either of these two. This line of reasoning leads to the hierarchical structure in (12), with the properties as indicated.

(12)

POSITION	Exponent of:	Allomorphy for:
<b>A</b> Pref-	SUBJ-AGR	— (MOOD)
<b>B</b> -Suf.Agr	OBJ-AGR	A
<b>C</b> -Suf.Class	CLASS (II)	A and B

Only the hierarchical structure indicated and the assumption that all allomorphy for agreement features is outwards-sensitive together actually derive the array of attested *and unattested* dependencies in the right-hand column of (12). The most embedded suffix, Class II, shows allomorphy conditioned by features of the agreement prefix and suffix, both of which are further out. The next most peripheral affix is the suffixal object agreement. This suffix shows allomorphy conditioned by features of the prefix (which is further out) but not for class (which is further in). Finally, the most peripheral of the affixes considered here is the subject agreement prefix which shows no allomorphy for agreement or class features expressed elsewhere (though it does show portmanteau-like allomorphy for mood).

The argument hinges in part on extending the observation that allomorphy for agreement features is outwards-sensitive in the case where it is demonstrable (the two suffixes) to the case where it is not directly observable (prefix-suffix). Importantly, though, it is not clear that any conceivable alternative would fare equally well in

<sup>14</sup> The apparent exceptions have once again to do with 2<sup>nd</sup> person subject, in this case, 2<sup>nd</sup> person subjects acting on 3<sup>rd</sup> person objects in the irrealis mood. When the object is 3PL, the forms are Class I: q-VERB-xi?n vs. Class II: q-VERB-čŷ<sup>w</sup>-i?n. The lack of a /x/ in Class II may have a phonological explanation. With 2SG subject acting on 3SG object (irrealis) the forms are Class I: q-VERB-x vs. Class II: q-VERB-xčik. The č~Ø alternation is mysterious (though the -xč form surfaces also with intransitives 2SG subject, irrealis); this form also involves the anomalous peripheral Class II suffix mentioned in note 13.

predicting exactly the range of dependencies indicated in the right-most column of (12). For example, a flat structure—or, equivalently, the assumption that sensitivity for syntactic features may be either inwards or outwards, as in Halle & Marantz 1993<sup>15</sup>—would admit the attested sensitivities, but it would leave as accidental the range of non-attested dependencies. Thus, there would be no account of why the prefix does not depend on person-number of the object or on conjugation class.<sup>16</sup> The importance of the assumption that all allomorphy considered thus far is uniquely outwards-sensitive (and thereby the justification of this assumption) is that it explains not only what dependencies do occur but also what dependencies do not. In the following section, I will provide an account of what this particular assumption may follow from.

Finally, it is important to stress that we are clearly dealing here with at least one dependency that cannot be reduced to (structural) adjacency. In the tree in (12), the prefix (A) and object agreement suffix (B) are structurally adjacent, a relationship that may be important. However, the dependency between class (C) and prefix (A) is non-adjacent. One may propose an alternative structure, in which class is hierarchically between the prefix and the suffix, and thus adjacent to both, e.g.: [[[PREFIX [VERB]] CLASS.II] SUFFIX.AGR]. Clearly though, if the class II marker intervenes between prefix and suffix (in order to be adjacent to both), then the prefix and suffix are no longer adjacent and the dependency of the suffix on the prefix must be non-adjacent. If the structure is not flat, then adjacency alone (even structural adjacency) is not sufficient to describe all the relationships which condition allomorphy. In other words, if the structure is flat, then the asymmetries in Table (12) are unexplained.<sup>17</sup>

## 2 Inwards and Outwards Sensitivities

In the previous section it was shown that a succinct account of the range of dependencies attested—and unattested—among the inflectional morphemes of Itelmen relied on three

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<sup>15</sup> This is not strictly accurate—the context for allomorphy in Halle & Marantz 1993 is ‘government’, however their X° adjunction structures generally permit mutual government and thus the characterization given in the text.

<sup>16</sup> As in any theory, not every theoretical possibility will be instantiated in a given language. Thus, I have no account of why the 3<sup>rd</sup> person object agreement allomorphy is sensitive to the number of a 2<sup>nd</sup> person subject but not to the number of a 1<sup>st</sup> person subject. Ultimately, gaps must be countenanced; the question at hand is one of degree: if a particular prefix did not show allomorphy for a particular suffix, this would be a candidate for an accidental gap, however if *no* prefix shows allomorphy for *any* suffix, then this suggests a generalization in search of an explanation.

<sup>17</sup> As observed by Susi Wurmbrand (personal communication, 1996) the range of allomorphy for subject features displayed by the class II markers in (11) shows a partial correspondence with the range of allomorphy for subject features displayed by the object agreement in (8). For example, subject number is important in both tables for 2<sup>nd</sup> person, but subject number is irrelevant in both tables for 1<sup>st</sup> person. This is initially suggestive of an account in terms of adjacency and feature transmission along the following lines: given morphemes/positions A>B>C; C may depend on A just in case B is also dependent on A. Such an approach is challenged however, by 3<sup>rd</sup> person subjects. The object agreement suffixes are not conditioned by the number of a 3<sup>rd</sup> person subject, but the class markers are.

interrelated observations. First, allomorphy for agreement features is outwards-sensitive; second, such allomorphy is only outwards-sensitive; and third, inwards-sensitivity is restricted to morphophonological diacritic features. Assuming that various (hopefully minor) complications, put aside here, can be overcome, one might leave this as a set of generalizations about Itelmen morphology. However, I believe it is possible to derive these observations from much deeper principles, in other words, to seek an explanation of why Itelmen behaves the way it does in terms of a universal theory of morphology. In this section, I will show how the particular conjunction of observations about Itelmen inflection follows from a constellation of assumptions about morphology (those given in (3), repeated below). To the extent the generalizations about Itelmen (from Bobaljik & Wurmbrand 1997) are both correct and sufficiently general, they therefore constitute support for a theory adopting the assumptions in (3) (such as Distributed Morphology, suitably modified—see below) and a challenge for any theory rejecting these assumptions. (I will postpone until section 4 a consideration of how this may be reconciled with the results of Carstairs 1987 whose Peripherality Constraint (p.193) dictates that no allomorphy for features such as agreement should be outwards.)

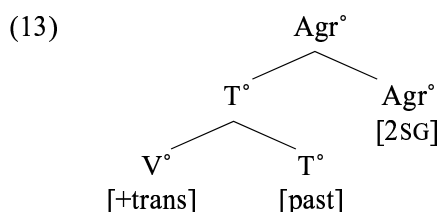
- (3) • separation: morphology interprets syntactic structures, rather than feeding them,  
 • cyclicity: this interpretive procedure (*vocabulary insertion*) proceeds root-outwards, and  
 • rewriting: as morphosyntactic features are *expressed* by vocabulary items, these features are *used up* and no longer a part of the representation.

Let us begin with the cyclicity assumption, as it is the most straightforward. As noted in the introduction, a cyclic theory of morphology can derive some form of No-Lookahead condition. Simpson & Withgott 1986 gave an example from derivation: quite typically a derivational affix may (appear to) subcategorize for information inwardly—i.e., it may “care” about what it attaches to, but derivational affixes do not themselves subcategorize for more external affixes. Another example is the distribution of infinitive suffixes in French, determined largely by an arbitrary diacritic of the verbal stem. Verb stems are divided into a series of largely arbitrary classes, a division which plays no role in syntax. However, this division dictates the choice of infinitive suffix (*-er, -ir, -re*). It should be clear that the choice of infinitive allomorph must wait until the verb stem has been inserted, i.e., until the information about conjugation class membership has been added to the representation. In sum, the hypothesis of cyclicity derives the observation that contextual allomorphy should be inwards-sensitive. The fact that sensitivity to conjugation class is inwards-sensitive (in French and Itelmen) is thus a special case of this more general principle.

It is clear, though, that not all cases of allomorphy are inwards-sensitive. It is thus incumbent on any theory of morphology to provide enough relaxation of the No Lookahead condition to admit attested cases of outwards-sensitivity, while at the same time retaining enough of the condition to exclude unattested cases. Here certain “Separationist,” “Post-Syntactic” (or “realizational”) models of morphology (such as DM) make apparently the right “cut.” These models contrast with more traditional or

lexicalist views (e.g., as in Lieber 1980, DiSciullo & Williams 1987) in that the former hypothesize that the concatenation of features (derivation, word-formation) is distinct from (and prior to) the realization of these features (affixation). Morphology on these theories is thus “separated” or “distributed” into (at least) two components, the one putting abstract bundles of features together and the other providing phonological content to the resultant structures. A concrete example may make this clearer.

A leading idea of DM is that the syntax manipulates what one might call abstract morphemes, concatenating terminal nodes defined by their (bundles of) syntactically relevant features. Thus, a syntactic representation of a finite verb in Germanic or Romance may have a structure as in (13), the result of head-movement of V to T to Agr.<sup>18</sup>

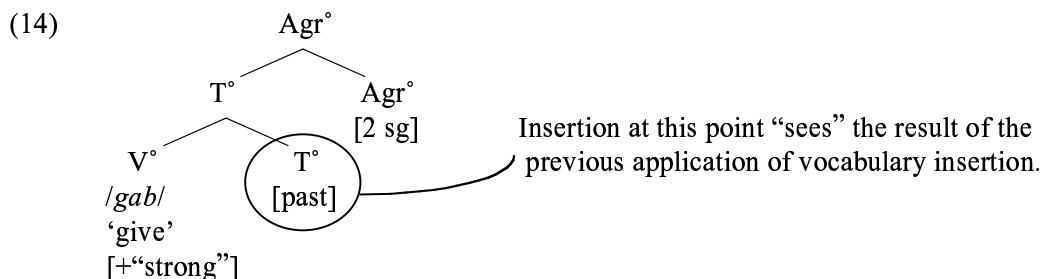


The resulting syntactic object is then fed to the morphology component, which provides the appropriate phonological pieces for each of the terminal nodes in the structure. If this process of *vocabulary insertion* is cyclic, then the considerations regarding No Lookahead discussed above will hold only of information added by the process of vocabulary insertion. That is, the cyclicity hypothesis derives only the condition that sensitivities such as allomorphy are restricted to information (features) already present in the structure. For features added by vocabulary insertion (i.e., diacritics and phonological information), this is equivalent to No Lookahead. However, for morphosyntactic features, which are present in the representation prior to any operation of vocabulary insertion, No Lookahead will not apply. We thus expect (and find) that the form of the verb stem may vary for a syntactic feature expressed more peripherally, in violation of the strongest version of No Lookahead. For example, in Germanic, the verb stem may show variation for tense or agreement features.<sup>19</sup> Once the verb stem (in this

<sup>18</sup> The example is chosen for familiarity. It is not important to the illustration here whether or not Agr is a distinct head in the syntax as proposed in Pollock 1989 or is appended subsequently in the morphology Halle & Marantz 1993 (though see Bobaljik & Thráinsson 1998 for arguments that in Germanic at least, the structure in (13) must involve multiple syntactic heads). The schema could be recreated with a different choice of X° heads.

<sup>19</sup> Once again, I am using familiar examples to illustrate the working of the theory. There is a good deal of controversy regarding the proper treatment of stem changes, especially as to whether or not they constitute ‘allomorphy’ in the same sense as predictable alternations in the form of affixes. (For Halle & Marantz 1993 these changes are the result of phonological *readjustment rules*.) If the reader is uncomfortable with the treatment of stem changes as allomorphy, the point may be illustrated by substituting the appropriate trees for any of the cases of outwards-sensitive allomorphy among affixes, considered in the text above and below. In work in progress (see handouts from Bobaljik 1999b, I am exploring the issue of stem-allomorphy versus

case *gab-* the past tense allomorph of ‘give’)<sup>20</sup> has been inserted, the next point of insertion is Tense. At this point, consider what information is present in the structure (schematized in (14)). Non-syntactic information expressed more centrally, e.g., about the specific choice of verb stem (including diacritics, such as conjugation class, represented in Germanic by the feature [ $\pm$ “strong”]) is now available (the verb stem has been inserted into the representation). More peripherally, it is still only syntactic features that are present.



It is in this way that the hypothesis that morphology is separationist and post-syntactic (“realizational”) in conjunction with the cyclicity hypothesis leads to the conclusion that the No-Lookahead constraint will hold only of features which are not a part of the syntactic representation. In other words, outwards-sensitivity should be possible, but only conditioned by those features that are relevant to the syntactic computation. Morphophonological diacritics, such as conjugation class, which are not a part of the syntactic computation and which are thus added with the phonological features via vocabulary insertion, can only serve as the context for allomorphy of a more peripheral affix. In other words, on the approach being developed here, No Lookahead is far from an independent “principle” of grammar. Rather, it is a descriptive generalization, only partially accurate. Both the generalization and its limited domain of application are in fact straightforwardly derived from deeper principles.

A diagram such as that in (14) reasonably precisely characterizes the behaviour of the Class II affix in Itelmen, described above. The presence of this affix is directly conditioned by an arbitrary diacritic of the verb stem (i.e., conjugation class)—this sensitivity is inwards, and does not require adjacency (e.g., the tense suffix intervenes in (9b) and (10b)). In addition, this affix shows allomorphy sensitive (outwards) to agreement features expressed by the prefix and suffix. These violations of No Lookahead

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(morphologically conditioned) “minor” phonological (or readjustment) rules.

<sup>20</sup> Note that it is incorrect to equate stem allomorphy/readjustment rules (vowel changes, or rime changes), which may be conditioned by syntactic features, with the expression of those features. As discussed at length by, e.g., Halle & Marantz 1993, Noyer 1997, the two are logically dissociated and one, both or neither may characterize any given form. For example, English verbs *tell*, *sell* show vowel changes in the past in addition to taking the regular past tense affix: *tol-d*, *sol-d*. Similarly, in German there are verbs which have a rime change in the past and take the regular past tense suffix, e.g., *send-en* ‘to send’, → (*sie*) *sand-te* ‘(she) sent-PAST’; *bring-en* ‘to bring’ → (*sie*) *brach-te* ‘(she) brought-PAST’.

are sensitive to agreement, a feature with syntactic relevance, and are thus exactly the class of features for which No Lookahead is predicted not to hold.

Another example of such outwards-sensitivity among affixes is presented by Stump 1997 from Bulgarian. In this language, a ‘preterite’ suffix (Stump’s term) alternates between *-x-* and  $\emptyset$ , conditioned by the person and number of the subject, though the actual agreement affixes are themselves peripheral to the preterite suffix. A partial paradigm is given below:<sup>21</sup>

(15) Aorist of *pek-* ‘bake’ and *igra-* ‘play’: (Stump 1997:226)

psn \ #	singular	plural	singular	plural
1 <sup>st</sup>	pék-o-x	pék-o-x-me	igrá-x	igrá-x-me
2 <sup>nd</sup>	pék-e	pék-o-x-te	igrá	igrá-x-te
3 <sup>rd</sup>	pék-e	pék-o-x-a	igrá	igrá-x-a

In sum, we conclude that outwards-sensitivity is for morphosyntactic features such as agreement, while sensitivity for morphophonological diacritics such as conjugation class is inwards. This state of affairs follows directly from two assumptions (cyclicity, and post-syntactic realizational morphology) for both of which there is ample independent support and which taken together characterize a class of current theories (including DM).<sup>22</sup> We are now armed with a contentful interpretation of the quote from Carstairs-McCarthy 1992 in the introduction. The “vague information about what has yet to be spelled out” constitutes the class of syntactic features, present in the structure prior to any vocabulary insertion. (Note again that this interpretation differs from Carstairs-McCarthy’s own view, to which I return below.)

<sup>21</sup> Depending on how the *o~e* alternation in *pék*-class verbs is handled, the Bulgarian case may involve adjacent morphemes. Stronger arguments of course come from non-adjacent interactions, as in Itelmen. Another potential case of non-adjacent outwards-sensitivity among affixes may be the allomorphy of the “aspectivizers” in Kiranti languages such as Yakkha, as identified by van Driem 1994, brought to my attention by E. Dorgan. I do not fully understand the data at this time.

<sup>22</sup> An important caveat must be made here. The arguments for No Lookahead (even relativized, as in the text) come primarily from derivational morphology (cf. Simpson & Withgott 1986’s discussion of subcategorization). As Lookahead is countenanced for syntactic features, it is difficult to tease out potential counter-examples in the realm of inflectional morphology. For example, in German certain verbs undergo a vowel change (umlaut) in the present tense in the 2<sup>nd</sup> and 3<sup>rd</sup> person singular, but nowhere else. While there is a clear historical source for this, there is no simple synchronic phonological account (cf. *sie gib-t* ‘she give-3SG’ vs. *ihr geb-t* ‘you give-2PL’; homophonous affixes behave differently in triggering the vowel change). Assuming (which is controversial) that this change is (stem) allomorphy, we ask whether it is triggered by the features [2SG],[3SG] or by (arbitrary diacritics of) the affixes (vocabulary items) themselves. The former would be consistent with the theory developed here, the latter would be inconsistent, unless interactions under adjacency constitute a special case as I suggested in Bobaljik 1999a. I see no compelling evidence either way for the German case or for a number of similar cases in the literature.

One thing has been left imprecise however, and this is directly relevant for the final part of the argument. This concerns the nature of vocabulary insertion. Implementations of realizational approaches to morphology differ on the question of what syntactic features remain in the representation once vocabulary insertion has supplied a phonological string. The tree in (14) for example retains the category label “V°” on the lowest node, after vocabulary insertion has taken place. At the next node up, after the appropriate tense suffix is added, we ask whether or not the morphosyntactic features (such as [+past]) remain as a part of the representation. If they do, then they should be accessible to condition allomorphy at positions further out. That morphosyntactic features do remain a part of the representation is explicitly maintained in Halle & Marantz 1993 and Noyer 1997:*lxii*.<sup>23</sup> On the basis of the Itelmen data, this appears to be the wrong conclusion. We have noted not only that outwards-sensitivity to morphosyntactic features is possible, but that inwards-sensitive allomorphy for such features is unattested. There is thus an asymmetry in Itelmen, where DM would predict symmetry.

The observed asymmetry in Itelmen finds a straightforward account if instead we view vocabulary insertion as a replacive operation, i.e., a system of rewrite rules. In Halle & Marantz 1993 the operation adds phonological features (and diacritics) to a given node, leaving the original features intact,<sup>24</sup> by contrast, I suggest with Halle 1990:156 (see also Trommer 1999) that the mechanism of vocabulary insertion is literally replacive: vocabulary insertion “eliminates the abstract morpheme [bundle of features] ... from the syntactic string, replacing it by zero or a concrete sequence of phonemes. As a result... once the [abstract] morpheme is spelled out, i.e. replaced ... the string in question can no longer serve as the input to any later rule that spells out [its features].”<sup>25</sup>

To conclude this section, consider the derivation of the verb (9b), repeated here.

- (9) b. t-t̕-s-ki-čeʔn (... č'eβuzlay - aʔn kłčl - eʔn).  
 1S:SU-bring-PRES-II-1>3P:OB (... tasty-pl rotten.heads-pl)  
 'I'm bringing tasty rotten (mouse) heads' [KL:25]

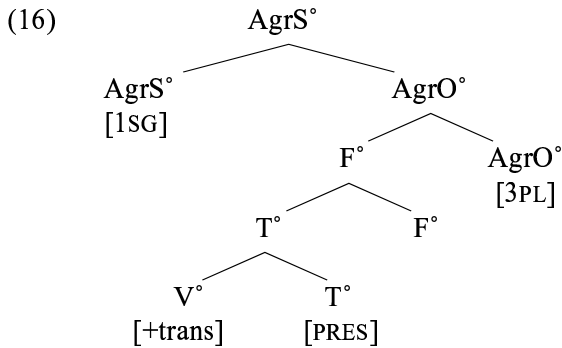
<sup>23</sup> Halle & Marantz 1993:154ff cite Potawatami evidence to support this part of their theory. They argue that a more peripheral Agr node is impoverished by a subset of the features of a more central Agr node, but not by the actual vocabulary item. If their analysis of this relationship is correct, then the third assumption of the introduction is directly challenged. However, ongoing work on (related) Eastern Algonquian languages (especially Wampanoag) suggests at least a partial syntactic account for the presence/absence of the more peripheral Agr (perhaps in terms of specificity or definiteness). I thank Alec Marantz, Andrea Rackowski and Benjamin Bruening for discussion of the Algonquian data and for sharing rough drafts of work in progress.

<sup>24</sup> Though perhaps marked in some way as “used” or “checked,” in order that they may remain to condition allomorphy, but not to trigger re-insertion of subsequent vocabulary items expressing the same features. On the distinction, see Noyer 1997:*lxii*.

<sup>25</sup> Halle 1990 notes that the principle of disjunctivity of morphological operations follows from this assumption. Trommer 1999 demonstrates that the use of zero morphemes in tandem with the assumption under discussion may therefore obviate the need for a special principle of disjunctivity. Non-trivial issues of locality arise, as in, e.g., the impoverishment of the Chukchi prefix discussed in the introduction.



This particular example shows the maximum range of allomorphy evidenced in the data. I assume that prior to vocabulary insertion, it has the structure in (16).<sup>26</sup>



Vocabulary insertion begins with the most deeply embedded node ( $V^\circ$ ) replacing this node with the phonological string  $/t\phi t/$  along with this stem's Class II diacritic. The second step of vocabulary insertion replaces the  $T^\circ$  terminal node with the appropriate tense morpheme  $-s$ .<sup>27</sup> At the next point of insertion ( $F^\circ$ ), the insertion of the Class II marker is triggered by the diacritic on the (previously inserted) verb stem but the particular allomorph for this marker (in this case  $-ki-$ ) is determined by the more peripheral agreement features [1SG] (subject) and [3PL] (object). Next, the appropriate 3<sup>rd</sup> person object agreement allomorph is selected from the table in (8), making crucial reference to the features at the subject agreement node. Finally, the appropriate subject prefix is selected. At this point, all other syntactic features have been expressed, i.e., replaced with the appropriate phonological strings. The subject agreement prefix therefore shows no allomorphy for the features at the object agreement position; nor could it have done so as the features are no longer there.<sup>28</sup>

<sup>26</sup> Though I take the structure in (16) to be derived in the syntax, the particular node labels have been chosen largely for mnemonic convenience. There is evidence that Mood (omitted) intervenes between AgrS and AgrO (if these are the correct labels). In addition,  $F^\circ$  (the node hosting the Class II affix) need not be present in the syntax, but may be appended post-syntactically, as in the manner suggested for “theme vowels” in DM. Note that Halle & Marantz 1993 also treat Agreement nodes as added post-syntactically (but crucially prior to vocabulary insertion). This would simply entail a relabeling of the nodes in (16), though it is not clear to me at this point that anything hinges on this notation.

<sup>27</sup> An exceptionless rule of Itelmen morphophonology fuses a verb-final  $t$  and present tense  $z$  into a single  $s$ .

<sup>28</sup> In principle, the subject prefix could show allomorphy for Class, though it does not. The theory predicts where allomorphy is possible and where it is impossible. However, the class of possible allomorphy admitted by the theory is still larger than the class of attested instances of allomorphy in any given language. Cases in which agreement morphology depends (at least in part) on a lexical specification of the verb stem are well documented (see Scancarelli 1987 on Cherokee, for example), thus this type is not excluded in principle, it is simply absent in Itelmen.

We see then how the range of attested allomorphy in the Itelmen verb, and the asymmetries witnessed therein, follow from a theory characterized by the assumptions in (3). The framework of DM, modified to incorporate the proposal that vocabulary insertion replaces syntactic structure (from Halle 1990), fits the criteria for being able to explain (as opposed to merely describing) the facts in section 1. Importantly, all three assumptions (especially the first two) have significant independent motivation. I am not positing three new assumptions to account for three observations. Rather, what I have attempted to show here is that the observed properties of (the initially complex) Itelmen inflectional allomorphy fall out directly from the adoption of three independently motivated assumptions. In this sense, the generalizations presented in Bobaljik & Wurmbrand 1997 and summarized above, if accurate, constitute, I believe, strong support for a theory that countenances these assumptions, and an equally strong challenge to theories which do not. Of course, this rests on showing that the characterization of legitimate domains for (different types of) allomorphy in Itelmen is generalizable cross-linguistically. To this end, I will begin the process in the next sections of addressing counter-examples, hoping to show that they are only apparent. The exercise itself is important, since if the generalizations turn out to be incorrect in any important way, then the constellation of assumptions from which these generalizations follow would be untenable.

### 3 Prefix-Suffix Interaction in Chukchi

One need not look too far to find apparent counter-examples to the theory proposed here. Chukchi, spoken to the North of Itelmen, has a strikingly similar inflectional system, as noted above. However, in contrast to Itelmen, there appears to be at least one instance of a mutual or symmetrical conditioning relation between the (subject) prefix and the (object) suffix. If both relations involve allomorphy for agreement features, then the proposal above (in particular, the third assumption) is jeopardized, and with it, an explanatory account of the asymmetries in Itelmen inflection. While some kind of mutual conditioning in Chukchi is apparently undeniable, I will argue that the outwards-sensitivity (allomorphy of the subject, conditioned by the prefix) is, like Itelmen, sensitivity to agreement features, but that the inwards-sensitivity (apparent bleeding of the prefix, conditioned by the suffix) is sensitivity not to syntactic features but rather to a particular vocabulary item. Given the hypothesis of cyclicity, as discussed above, sensitivity to a specific vocabulary item *must* be inwards as sensitivity is restricted to information already present in the morphological representation. The conclusion is that mutual sensitivity among positions is not problematic, but is possible only to the extent that the individual components of the sensitivity respect the conditions on directionality established in section 2.

**3.1 The Apparent Problem** Like Itelmen, Chukchi 3<sup>rd</sup> person object suffixes are (partly) sensitive to features of the subject, features canonically expressed in the prefix

position. In (17)-(18), varying the person of the subject changes not only the prefix, but also the form of the 3<sup>rd</sup> person object suffix (boldfaced) in both languages.<sup>29</sup>

- (17) a. itχ isx n-əʃčqu-z – **nen** (Itelmen)  
 they father 3P:SU-see-PRES-3>3S:OB  
 ‘They see father’ [S1:77]
- b. ənan əʃjon ʃʔu – **nin** (Chukchi)  
 3S:ERG 3S:ABS see-3S>3S:OB  
 ‘(S)he saw him/her/it’ [SKOR:44]
- (18) a. kməɫβun na t’-əʃčqu-s – **čen** (Itelmen)  
 1S:EMPH 3s 1S:SU-see-PRES-1>3S:OB  
 ‘I see him’ [S1:75]
- b. γəmnan əʃjon tə ʃʔu – **γʔen** (Chukchi)  
 1S:ERG 3S:ABS 1S:SU-see-3S:OB  
 ‘(S)he saw him/her/it’ [SKOR:44]

There is one point of marked contrast between the two languages, though. Unlike Itelmen, the Chukchi 3<sup>rd</sup> person object allomorph used with 3<sup>rd</sup> person singular subjects appears to bleed the appropriate subject prefix. In Itelmen (17a), the regular 3<sup>rd</sup> plural subject prefix *n-* is unaffected by the fact that the *-nen* suffix unambiguously indicates a 3<sup>rd</sup> person subject. By contrast, in Chukchi the regular 3<sup>rd</sup> person transitive subject prefix *ne-* is absent in (17a), though it is obligatory in all forms that do not have the *-nin* suffix (or its plural alternate *-ninet*).<sup>30</sup> Contrast (19c,f) with the rest of this paradigm of the verb *ʃʔu-* ‘see’ (the relevant morphemes are collected in the table in (20)).<sup>31</sup>

<sup>29</sup> Chukchi does not show as much allomorphy in the 3<sup>rd</sup> person suffixes as Itelmen does, though the contrast in (17b) vs. (18b) establishes the basic case. For fuller paradigms and discussion, see Bobaljik 1998. Note also that the sequence *-γʔe-* is likely not a proper part of the 3<sup>rd</sup> person object suffix as only the final *-n(et)* is consistent to the 3<sup>rd</sup> person object suffixes through all tenses, see (22) below.

<sup>30</sup> In the Khalatyr dialect of Chukchi (see Skorik 1977:43, fn40) and in Koryak (e.g., Zhukova 1972:253ff) the *ne-* prefix is used with 2<sup>nd</sup> person subjects, with 1<sup>st</sup> person objects in some environments. Due to the prefix’s extension beyond 3<sup>rd</sup> person into 2<sup>nd</sup> person, M. Dunn (personal communication, 11/98) proposes to treat the prefix as an inverse marker. Importantly, in these varieties as well, the prefix is in complementary distribution with the *-nin* suffix (see paradigms in references cited), and thus the features assigned to the prefix (3 TRANS vs. INVERSE) may not matter for our purposes. Within the framework adopted here, the prefix might better be treated as a default. In support of the latter position, note that there are various other syncretisms which succumb straightforwardly to an analysis in terms of defaults, but cannot be subsumed under the inverse label. These include the syncretism between 2<sup>nd</sup> and 3<sup>rd</sup> persons singular in the intransitive suffixes in Chukchi/Koryak and the fact that the corresponding *n-* (Irrealis (*x*)*vn-*) prefix has spread not to 2<sup>nd</sup> person but to 1<sup>st</sup> person (plural) subjects (and impersonals) in (Southern, i.e., Khairjuzovo) Itelmen (see Bobaljik & Wurmbbrand 1997, n.10, Volodin 1976:227, 232).

<sup>31</sup> Data from Skorik 1977:44-45. Note that the combination of 3<sup>rd</sup> person singular subject acting on 1<sup>st</sup> person singular patient (‘He saw me’) requires the use of the Inverse or “spurious antipassive” form: a morphologically antipassive (hence, intransitive) verb form but with no change in case

- (19) ‘X saw Y’ (Chukchi), Skorik’s Past I [SUBJECT > OBJECT]
- |      |             |              |              |                   |                       |
|------|-------------|--------------|--------------|-------------------|-----------------------|
| (a.) | ənan        | ɣəm          | _____        |                   | [3SG > 1SG]           |
| b.   | ənan        | ɣət          | ne -ʔu       | -ɣət              | [3SG > 2SG]           |
| c.   | <b>ənan</b> | <b>ətʃon</b> | <b>_____</b> | <b>-ʔu -nin</b>   | <b>[3SG &gt; 3SG]</b> |
| d.   | ənan        | muri         | ne -ʔu       | -mək              | [3SG > 1 PL]          |
| e.   | ənan        | turi         | ne -ʔu       | -tək              | [3SG > 2PL]           |
| f.   | <b>ənan</b> | <b>ətʃi</b>  | <b>_____</b> | <b>-ʔu -ninet</b> | <b>[3SG &gt; 3PL]</b> |
| g.   | əɣənan      | ɣəm          | ne -ʔu       | -ɣəm              | [3PL > 1SG]           |
| h.   | əɣənan      | ɣət          | ne -ʔu       | -ɣət              | [3PL > 2SG]           |
| i.   | əɣənan      | ətʃon        | ne- -ʔu      | -ɣʔen             | [3PL > 3SG]           |
| j.   | əɣənan      | muri         | ne -ʔu       | -mək              | [3PL > 1 PL]          |
| k.   | əɣənan      | turi         | ne -ʔu       | -tək              | [3PL > 2PL]           |
| l.   | əɣənan      | ətʃi         | ne -ʔu       | -net              | [3PL > 3PL]           |

(20)

CHUKCHI – INDICATIVE, PAST I			
SUBJ	DIRECT OBJECT		
	1	2	3
3SG	SG	**	ne- -ɣət
	PL	ne- -mək	ne- -tək
3PL	SG	ne- -ɣəm	ne- -ɣʔen
	PL	ne- -mək	ne- -net

The Chukchi pattern thus appears to show partially symmetric sensitivities: the suffix cares about the prefix and the prefix cares about the suffix. Thus, *-nin* is the particular allomorph of the 3<sup>rd</sup> person object suffix *conditioned* by a [3SG] subject, and at the same time, the subject prefix alternates between *ne-* and  $\emptyset$  (in this mood) depending upon whether or not the object suffix is *-nin(et)*. That the interaction here is systematic is supported by the fact that the distribution of *ne-* is replicated exactly in the Hortative mood,<sup>32</sup> where the corresponding 3<sup>rd</sup> person transitive subject prefix is *əʔ-*:

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marking or clausal syntax (thus reminiscent of *deponent* transitive verbs, in e.g., Greek). See Comrie 1979b, Spencer 1996, Halle & Hale 1997 for discussion of this construction in Chukchi.

<sup>32</sup> Also called “Imperative.” This mood corresponds to what I have called the Irrealis in Itelmen. Note that this mood has a full paradigm, i.e., for all persons and numbers. The segmentation of the complex prefixes into an agreement component (*əʔ-*) followed by a mood component (*-n-*) on the basis of the parallel with (20) was suggested by Ken Hale.

(21)

CHUKCHI – HORTATIVE						
SUBJ	DIRECT OBJECT					
	1		2		3	
3SG	SG	**		əʔ-n-	-γət	Ø-n- -nin
	PL	əʔ-n-	-mək	əʔ-n-	-tək	Ø-n- -ninet
3PL	SG	əʔ-n-	-γəm	əʔ-n-	-γət	əʔ-n- -γʔen
	PL	əʔ-n-	-mək	əʔ-n-	-tək	əʔ-n- -net

My claim here is that the Chukchi case does not, in fact, involve inwards-sensitivity of the prefix to particular features of the object agreement but rather to the actual vocabulary item *-nin*. In other words, the absence of the prefix *ne-* in the top right cell of (20) (and of *əʔ-* in (21)) is not due to the features [3<sup>rd</sup> person object] but rather is a case of *impoverishment* (i.e., systematic deletion of features or a position) triggered by the presence of a particular vocabulary item, exactly the kind of sensitivity which must be inwards, given the cyclicity hypothesis. The distinction is admittedly subtle, and the evidence perhaps thin, but I believe consistent with the proposals in the previous section. I will also attempt to show that available alternatives fare somewhat worse than the proposal here.

**3.2 Vocabulary Items versus Features** There are two arguments that it is the vocabulary item *-nin(et)*<sup>33</sup> and not the features it expresses that is responsible for triggering deletion of the 3<sup>rd</sup> person prefix. The first argument is that appeal only to the features that *-nin* expresses is insufficient to determine where the prefix does and does not disappear. The second is that there is one environment in which the features for *-nin* are arguably present in the representation but for independent reasons, *-nin* fails to be realised. In exactly these cases, the prefix is not deleted. Thus, we conclude that the proper characterization of the rule deleting the prefix makes reference (inwards) to the presence or absence of the particular vocabulary item, the suffix *-nin*.

**3.2.1 *-nin* vs. 3<sup>rd</sup> Person Object** The table in (22) summarizes the 3<sup>rd</sup> person object suffixes across the four verbal tense/aspect combinations in Chukchi. As the table shows, the *-nin(et)* forms surface in all and only the cells with a 3<sup>rd</sup> singular subject. If there is a stable tense/aspect marker (-rkən- or -γ~η-) then *-nin(et)* follows this marker.<sup>34</sup>

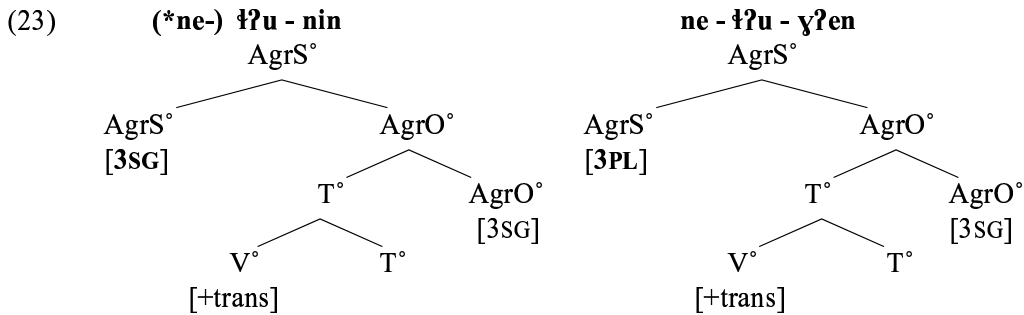
<sup>33</sup> Henceforth I will concentrate only on the singular object forms in *-nin* as the plural *-nin-et* is transparently derived from this via the addition of the regular plural suffix *-et*.

<sup>34</sup> The *-γ~η-* alternation is phonological and regular. There are some thorny questions of segmentation with certain forms, e.g., the appearance of *-i-* in the 2pl subject forms in Pres I is mysterious, though “linking” *-i-* and *-ə-* are prevalent throughout Chukchi paradigms.

(22)

CHUKCHI 3 PSN OBJECT SUFFIXES (Skorik 1977:61-62)						
SUBJ	PRES I, FUT II		PAST I		FUTURE I	
	3SG	3PL	3SG	3PL	3SG	3PL
1SG.	-rkən	-rkənet	-yʔen	-net	-ŋən	-ŋənet
2SG.	-rkən	-rkənet	-yʔen	-net	-ŋən	-ŋənet
3SG.	-rkənin	-rkəninət	-nin	-ninət	-yʔnin	-yʔninət
1PL.	-rkən	-rkənet	-yʔen	-net	-ŋən	-ŋənet
2PL.	-rkənitkə	-rkənitkə	-tkə	-tkə	-ŋətəkə	-ŋətəkə
3PL.	-rkən	-rkənet	-yʔen	-net	-ŋən	-ŋənet

Consider now the morphological representation of Chukchi verbs, which we take to be parallel to Itelmen (except that there is no Class marker). For illustration, take two verbs, one with a [3SG] subject acting on a [3SG] object, and the other with a [3PL] subject acting on a [3SG] object. The relevant, pre-vocabulary insertion structures (with only morphosyntactic features) are given in (23), with the corresponding verb forms given above. Note that the prefix is only absent in the left-hand verb form.



As indicated by the structures in (23), the feature make-up of the object agreement node (AgrO) is in each case the same, namely, it reflects the features of the object (3SG) in both cases. No appeal to the features of the AgrO node will suffice to determine whether or not the prefix deletes (or fails to be inserted). Put differently, the relevant difference between *-nin* and *-yʔen* is not one of the syntactic features they realise. The difference between the two AgrO nodes arises only after vocabulary insertion has applied. At this point, the two contextually determined allomorphs for [3SG] object agreement are in competition for the AgrO node. We characterize these allomorphs as in (24), with the more highly specified case taking priority (by the Elsewhere principle).

(24)

Vocabulary Item...	Expresses...	In the Context of...
<i>-nin</i>	⇔ [3 <sup>RD</sup> OBJECT]	/ 3SG.SUBJECT
<i>-(yʔe)n</i>	⇔ [3 <sup>RD</sup> OBJECT]	elsewhere

The choice between the two alternants of [3SG] object is determined by syntactic features expressed farther out in the tree (namely, whether or not there is a [3SG] subject).

After insertion, the two AgrO nodes are clearly distinct, the one on the left containing *-nin*, that on the right having *-yʔen*.<sup>35</sup> In other words, given that [3SG] objects do not systematically delete the prefix (recall that the prefixes do not distinguish number for 3<sup>rd</sup> person subjects), we conclude that it is not the features at the AgrO° node that are responsible for the deletion of the prefix. The appearance of mutual conditioning for agreement features is epiphenomenal; the features at the prefix position (AgrS) trigger a particular allomorph of (i.e., vocabulary item expressing) the suffixal (object) agreement, and it is that allomorph (not its features) which triggers deletion (or impoverishment) of the prefix position.

**3.2.2 The Ditransitive Verb give** The argument just made is reinforced by observations concerning the behaviour of the ditransitive verb *jəl-* ‘give’. In all the Chukotko-Kamchatkan languages, this verb<sup>36</sup> allows or in certain cases requires agreement with the dative marked indirect object (goal) in lieu of agreement with the (absolute or unmarked) direct object. In such instances, we find the syntactic configuration for *-nin* and for bleeding of the prefix (i.e., [3SG] subject acting on a [3SG] direct object), but *-nin* fails to appear. Here again, we may test whether the impoverishment of the prefix is brought about by the features [3SG] object (in the environment of a [3SG] subject) or whether the key factor is the actual appearance of the *-nin* suffix. We will see that it is the latter. Examples of indirect object agreement are given in (25).

- (25) a. *tə-jəl-ər-kən-iyət* (Chukchi)  
 1S:SU-give-PRESI-2S:OB  
 ‘I give something to you’  
 (also: ‘I give you to someone’) (Nedjalkov 1976:208)
- b. *isx-enk n-zəl-ał-um* kza kəma-nk? (Itelmen)  
 father-LOC IMP-give-FUT-1SG. OBJ you me-DAT  
 ‘Will father give you to me?’ [S3:80]

In Chukchi, the factor determining which of the two internal arguments triggers agreement on the verb has been reported to be a person hierarchy (1,2 > 3) (see Comrie 1979a); thus, if either of the arguments is 1<sup>st</sup> or 2<sup>nd</sup> person, then it will trigger agreement prejudicially over a 3<sup>rd</sup> person. There is no syntactic evidence that points to a 3<sup>rd</sup> person object being “demoted” in these constructions; for example, the case array suggests that the syntax remains unchanged by the shift in agreement. The relevant experiment, then, is to examine examples with subject and direct object both [3SG]. A [2SG] indirect object in such examples will preempt the occurrence of *-nin* in the suffix position, triggering instead *-yʔət*, as in (25a). If the impoverishment of the prefix is due to the syntactic

<sup>35</sup> This is independent of whether or not syntactic features are replaced by phonological strings in vocabulary insertion. It is the phonological strings/vocabulary items and not the syntactic features that distinguish the two AgrO° nodes.

<sup>36</sup> I.e., or its cognates, e.g., Itelmen *zəl-*. Itelmen also allows agreement with dative elements with a much wider array of verbs, see Bogoras 1922, Volodin 1984 and Bobaljik & Wurmbrand 1997.

configuration, one might expect this not to matter—the syntactic presence of the [3SG] object might trigger impoverishment. However, if what is relevant is the actual vocabulary item *-nin*, then its absence in the relevant ditransitive constructions should correlate with the presence of the prefix. The latter is indeed what we find: in exactly those circumstances in which the suffix *-nin* is bled by the animacy hierarchy effect, the [3 TRANS SUBJ] prefix *ne-* is retained.<sup>37</sup>

- (26) *ne-jəl-γət*                      *waly*                      (M. Dunn, p.c., 11/1998)  
 3:SU-give-2S:OB      knife.ABS      (NB: I have altered Dunn’s gloss)  
 ‘She/he/they gave you(sg) the knife’
- (27) *ənən*                      *γənəkə*                      *ənqen*                      *ne-jəl-γət*                      (V.P. Nedjalkov, p.c., 3/1999)  
 3SG:ERG      2SG:DAT      sth.(ABS)      3:SU-give-2S:OB      (NB: Gloss added by me)  
 ‘She/he gave you something’

This data reinforces the conclusion of the previous subsection. It is not the syntactic features of the object agreement position, nor the combination of subject and object features alone that determine whether or not the 3<sup>rd</sup> person transitive prefix (*ne-*, Hortative *əʔ-*) is impoverished. Rather, this determination is made with reference to the output of prior vocabulary insertion rules at the suffix position: if and only if the particular vocabulary item *-nin* has been inserted, the prefix is impoverished.

**3.3 Alternatives** On first inspection, the interaction of the prefix and suffix in Chukchi may be described as a case of *discontinuous bleeding*. That is, it appears as if the failure of the 3<sup>rd</sup> person transitive subject prefix to find expression exactly when the *-nin* allomorph of the object suffix is chosen is a result of a bleeding or blocking relation between these elements. In the analysis I have given, this relationship arises only indirectly, the result of a conspiracy, of sorts, between the positions and vocabulary items implicated. In the above paragraphs, I have provided arguments for the view I have taken, and shown that encoding the relation in this way leads to an overall picture consistent with a constrained theory of contextual allomorphy, and allows the asymmetric nature of the complicated interactions seen in both Itelmen and Chukchi to be explained by deeper principles of the grammar. At the “cost” of invoking a conspiracy in Chukchi, we reap the benefit of the possibility of explanation in a notoriously mystifying corner of morphology. As always, it is instructive to contrast the theory presented here with available alternatives. I will mention three approaches to discontinuous bleeding which would appear to be candidates for analysis of the Chukchi facts, and show briefly why these do not fare as well as the analysis presented above.

<sup>37</sup> An apparent counter example from Alutor (i.e., lacking the prefix, even though the suffix is not *-nin*) is given in Mel’čuk 1988:295 and cited in Bobaljik & Wurmbrand 1997:405. I. Mel’čuk (personal communication, 11/1998) reports that this particular form is anomalous among the data he has collected and that the prefix is expected, as noted above. A form with the expected prefix is given in Mel’čuk 1973:26.



The Chukchi data considered here is discussed in passing in Halle & Hale 1997 (whose main focus of study is the so-called “spurious antipassive” or inverse noted in fn. 31). They propose (p.23) that there is no impoverishment in the [3S:SU>3:OB] forms, but that rather, the prefix is “displaced” in exactly these forms. Thus, they suggest that the initial *n* of the suffix *-nin* is itself the “missing” prefix *ne-*, simply displaced to the right.<sup>38</sup> Note that if they are correct on this point, this poses no problem for the theory presented above; if there is no impoverishment, then the question of inwards-sensitivity simply does not arise. Nevertheless, I believe that there is evidence that the Chukchi data does involve a discrete suffix *-nin* and a concomitant impoverishment of the prefix. The primary argument against the displacement analysis comes from the Hortative forms in (21). There, the “missing” prefix is *əʔ-*, not *ne-*, but the pattern is the same, and, importantly, the form of the suffix *-nin* remains unaffected. A phonological account is not forthcoming for the shape of the prefix in the Hortative mood, since in other parts of the paradigm, *ne-* freely surfaces in a similar phonological environment, for example, in the Subjunctive: *ne-nʔə-βiriŋ-γʔen* [3:SU-SUBJUNCT-protect-3S:OB] ‘they should have protected him’ (Skorik 1977:96).<sup>39</sup> I take it therefore that the displacement analysis is not correct for the Chukchi data at hand, and we are truly dealing with a case of apparent disjunctivity (or bleeding) across positions.

Disjunctivity forms a major concern for the *A-morphous* theory of Anderson 1992, and in section 4.3.2 of that work the possibility of discontinuous bleeding is considered. Schematically, Anderson suggests that two types of mechanisms within his framework could yield the type of situation in which a prefix and a suffix are in a disjunctive or bleeding relation, along the lines of what we see in Chukchi. First, Anderson suggests (p.131) the possibility that a prefix and suffix may belong to the same “rule block” and thus be extrinsically specified as being in a disjunctive relationship. Second, disjunctivity across rule blocks is possible if it arises from the Elsewhere Principle (p.132). Neither approach can cover the Chukchi case.

Rule blocks, for Anderson, are arbitrary lists of rules introducing affixes, corresponding in spirit to the position classes of traditional morphology, but without the intrinsic connection to actual positions (i.e., a prefix and suffix may occupy the same rule block). Morphological competition between two affixes (i.e., cooccurrence restrictions not explainable by syntax, semantics or phonology) is attributed to the (rules introducing the) affixes occupying a common rule block—the central tenet of the theory is that only one rule from any block may apply. For example, since *ne-* competes with *-nin*, they would be assigned to a single rule block, with an (extrinsic) internal ordering. This accounts for the fact that only one of the two may ever surface. Now, there is also a complementarity between the two [3SG:OBJECT] suffixes, given in (24). That is, *-nin* competes with *-γʔen*. This would mean that *-nin* and *-γʔen* occupy the same rule block. In other words, on a rule block analysis, it would have to be the case that *-nin*, *ne-* and *-γʔen* (and *əʔ-*) all occupy the same rule block. Since only one affix from any rule block may

<sup>38</sup> The vowel here poses a question, though not an insurmountable one.

<sup>39</sup> Or ‘it would be good for them to protect him’. Skorik’s Russian paraphrase is ‘им защитить бы ero’. My thanks to A. Pereltsvaig, and L. Nossalik for suggestions regarding the translation.

be introduced, the analysis would incorrectly predict that the prefixes should be mutually exclusive not only with *-nin* but also with *-ɣʔen*. This is falsified, by the right hand form in (23), for instance.

Anderson recognizes that disjunctive rule blocks will not account for all cases of competition among, e.g., prefixes and suffixes and suggests that bleeding may also occur across blocks if it is caused by the (familiar) Elsewhere Principle: “application of a more specific rule blocks that of a later, more general one” (p.132), more precisely: the EP precludes the application of a rule (R1) if the structural description of that rule is contained in the structural description of another rule (R2) that has applied previously. In the cases at hand, one could suggest that the structural description (SD) of the (rule introducing the) *-nin* suffix is [3SG SUBJ, 3SG OBJ]. If the *ne-* prefix attaches later and is specified only as [3 SUBJ], a proper subset of the SD of *-nin*, then the EP would block the introduction of the *ne-* prefix when the *-nin* suffix has been attached. As *-ɣʔen* is not specified for subject properties, the EP does not block the cooccurrence of this suffix and the agreement prefix. There is a flaw in this line, though, which concerns the structural description of the *ne-* prefix. Recall that this prefix marks a 3<sup>rd</sup> person transitive subject only in the Indicative and Subjunctive moods. In the Hortative (21) the 3<sup>rd</sup> person transitive subject prefix with the same distribution is *əʔ-*. At least one of these prefixes must be specified for mood, in addition to [3 SUBJ]. The suffixes however, are unspecified for mood (as is readily seen in comparing (20)-(21)). The SDs of the prefix and suffix thus *overlap* in features, but neither is a subset of the other, for example: *əʔ-* [3SG SUBJ, HORTATIVE] vs. *-nin* [3SG SUBJ, 3SG OBJ]. Therefore, the Elsewhere Principle is inapplicable here.

Noyer 1997 proposes an analysis of discontinuous bleeding between prefixes and suffixes in the Afro-Asiatic Imperfect conjugation, developing an early version of Distributed Morphology (see Halle 1997 for discussion and a closely related alternative). In this conjugation, the prefix and suffix share the load of expressing the person and number features of the subject. As there is no reason to suppose that there are two subject agreement nodes in the syntax, Noyer argues that the syntax provides only one position which may be subsequently “split” into two affixes in the morphology (a process he calls *fission*). In contrast to Anderson’s rule blocks, there is no stipulated disjunctivity among the vocabulary items (phonological strings) eligible for a certain position; competition is enforced only by (essentially) the elsewhere principle.<sup>40</sup> Discontinuous bleeding is therefore, in the Afro-Asiatic imperfect, only superficially discontinuous—the prefix and suffix correspond to a single terminal node of the original morphological string. While Noyer’s framework is clearly not incompatible with the proposal here, it is not clear that the fission analysis would be appropriate for the Chukchi data. For transitive verbs, it is certainly reasonable to propose that there are distinct subject and object agreement nodes in the morphological representation. And for intransitive verbs, not only is there no competition among prefix and suffix, but impressionistically, the same features are typically expressed twice, once in the prefix and once in the suffix (see (5b) above).

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<sup>40</sup> Noyer and Halle supplement this with language-particular templates, for example ensuring that there is maximally one prefix in this conjugation.

Fission, therefore, does not seem to be a useful tool in describing the bleeding in Chukchi.<sup>41</sup>

In sum, the effect of discontinuous bleeding between *-nin* and *ne-* is admitted by our theory, but is described by a conspiracy of two interactions—allomorphy in the suffix position conditioned by the person/number features of the subject (24), and impoverishment of the suffix, conditioned by the appearance of a particular, more central vocabulary item, i.e., *-nin*. That there should be no necessary connection between the two is straightforwardly demonstrated by the Itelmen data, which displays the suffix allomorphy (8) but not the impoverishment rule. Moreover, I have tried to show that no current theory which would link the two processes would be able to adequately capture the entire range of data discussed, including the asymmetric nature of the various sensitivities.

**3.4 Section Summary** The above arguments are suggestive, if not conclusive. However, they are sufficient to establish that the Chukchi data need not constitute a counter-example to the generalizations made above in the paper. In addition, we have seen that available alternatives encounter problems which prevent them from being extended to the Chukchi data in any obvious way. At this point, it is important to establish that the move we have made (permitted by the theory) in distinguishing between allomorphy conditioned by a particular feature and that conditioned by a particular vocabulary item expressing that feature is in principle falsifiable. That is, we must ensure that this move is not a “trick” that can extend to every conceivable counter-example, voiding the theory of any predictive, hence explanatory value.

Consider again the discussion in 3.2.1. There, I argued that the impoverishment of the prefix was not triggered by the features of the suffix (i.e., [3SG] object) because these features correspond to more than one suffix, while only one of these suffixes triggers the impoverishment rule. One could imagine a Pseudo-Chukchi variety in which *any* 3<sup>rd</sup> person object triggered the impoverishment rule, regardless of the suffix that expresses the object. While conceivable, such a situation is excluded by the theory presented above. Inwards-sensitive contexts (including allomorphy and impoverishment) should not be sensitive to single features that correspond to a group of affixes. Similarly, we should not find cases of inwards-sensitivities to feature distinctions that are not reflected in individual affixes. For example, [+animate] plays a role in Chukchi morphosyntax, determining, among other properties, the form of the Ergative case suffix (Comrie 1979a:section 3). This distinction is not, however, reflected in the agreement morphology; the suffixes *-nin*, *-(yʔe)n* are used for all 3<sup>rd</sup> person objects regardless of

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<sup>41</sup> It should be noted that the Chukchi data may be expressed within the combination of Lexical Morphology and Position Class theories proposed by Inkelas 1993, though this theory would, I believe, have to treat the Itelmen asymmetries as accidental. In addition, while Inkelas’s theory may capture the fact of competition, it is not clear how the theory predicts which of two morphemes in competition will surface when the environments for both are met. On the theory presented here, the fact that *-nin* blocks *ne-* (as opposed to *ne-* blocking *-nin*) is a direct consequence of the cyclicity hypothesis. See Noyer 1998 for additional critique of Inkelas’s theory.

their position in the animacy hierarchy. Thus, a logically conceivable sensitivity, would be a restricted version of the impoverishment rule, deleting the prefix with suffix *-nin* when the object is, say, animate, but retaining the prefix along with *-nin* when the object is inanimate. Though logically conceivable, this sensitivity (appealing to a subdivision not reflected by the relevant morphemes) is not the way Chukchi works—for principled reasons, I contend: such a sensitivity is excluded by the theory. Summing up, the two kinds of logically possible Pseudo-Chukchi varieties that I argue to be excluded by the theory are schematized in (28).<sup>42</sup>

- (28) Impossible inwards-sensitivities (Pseudo-Chukchi):
- a. \* ne- → Ø / [3SG] object (corresponds to more than one suffix, see 3.2.1)
  - b. \* ne- → Ø / [3SG, +animate] (rule makes a distinction not corresponding to actual vocabulary items).

Obviously, the distinction between sensitivity to a vocabulary item and sensitivity to the features expressed by that item is subtle. Nevertheless, I have argued that these can be distinguished in a principled manner in at least some cases, and more importantly, that the impoverishment of the Chukchi 3<sup>rd</sup> person prefix is triggered in an inwards-sensitive by the actual vocabulary item *-nin*, one of a series of vocabulary items that express the features [3<sup>rd</sup> person object]. Chukchi then is consistent with the theory developed in section 2 in which it is argued that the two types of sensitivities operate in opposing directions and do so for principled reasons. Importantly, we may maintain the view that sensitivity for syntactic features not only may be, but must be, outwards. This, of course, runs directly counter to the *Peripherality Constraint* of Carstairs 1987, and it is to this that we now turn.

#### 4 The Peripherality Constraint

Carstairs 1987, in investigating the kinds of sensitivities explored here, proposed the *Peripherality Constraint* (p. 193).

- (29) The realisation of a [morphological] property P may be sensitive inwards, i.e., to a property realised more centrally in the word-form (that is, closer in linear sequence to the root), but not outwards to an individual property realised more peripherally (further from the root). The realisation of P may, however, be sensitive outwards consistently to *all the independently realised properties within a given category, that is to all those properties within the category with which the realisation of P is not entirely simultaneous.*” (italics in the original).

This is obviously at odds with the results of this paper as defended above. It is therefore important to reconsider the evidence presented in support of Carstairs’s conclusion and to see where the two approaches differ. I will leave certain issues open

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<sup>42</sup> An explicit case of what I take to be impossible exists in Halle & Marantz 1993’s analysis of Potawatami (p. 154ff) as mentioned in fn. 23 above.

here, but I believe that there are no fundamental challenges to the position I have presented, and that on closer inspection, a number of examples which appear to support (29) fall to alternative analyses.

Let us first take a closer look at the content of (29) from the perspective of the present discussion. First, we note that Carstairs-McCarthy does not for the purposes of (29) differentiate between what I have called morphosyntactic and morphophonological properties (or features). Thus for him, arbitrary diacritics such as conjugation class or “screeves”<sup>43</sup> which play no role in syntax are considered together with those features that do play a role in the syntax. In contrast, I have argued that this distinction is central to bringing to light the asymmetrical nature of the complex relationships seen in the C-K verb-word. There are three related points which I take to be at issue in the present paper, as discussed above. First, I have argued that allomorphy conditioned by morphophonological diacritic features such as class is (uniquely) inwards-sensitive (i.e., this is the domain of No Lookahead). Second, I have argued that allomorphy for agreement features may be outwards-sensitive. And third, I have argued that such allomorphy cannot be inwards sensitive.

On the first of these, Carstairs-McCarthy’s observations and mine are in agreement. Note that Carstairs 1987’s principle case of inwards-sensitivity among non-adjacent morphemes, (from Zulu) has exactly this characteristic—it is sensitive to noun class, a canonical example of what I take to be a diacritic of no syntactic relevance. I will sketch the main point of Carstairs 1987’s analysis here, and refer the reader to Carstairs 1987:157-161 for elaboration.

Carstairs analyses Zulu nouns used as possessors as being preceded by two prefixes, the innermost prefix reflects the class (and number) of the noun itself, and the outermost prefix (the “concordial prefix”) reflects the class (and number) of the possessed noun, as illustrated in (30).

- (30) a. [<sub>NP</sub> possessed.N possessor]: [CONCORD-CLASS-stem]  
 b. izin-ti            zezintombi (< za — izin — tombi)  
    11/10PL-sticks of:girls           11/10PL9/10PL girl  
    ‘the girls’ sticks’  
 c. ubu-so            bezintombi (< ba — izin — tombi)  
    14-sticks        of:girls           14     9/10PL     girl  
    ‘the girls’ faces’

The first prefix on the possessor in (30b-c) varies to reflect the class of the possessed noun (according to Carstairs, this is somewhat obscured by phonology—I give his underlying forms in parentheses to the right), *za-* with a class 11/10PL possessum in (30b)

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<sup>43</sup> The term is taken from the Georgian literature and refers to, e.g., a group of person-number endings that are distinguished from other person-number endings in having a common set of conditioning features. Rather than a derivative notion (as in many theories) screeves themselves are referred to directly in the contexts for the realization of other morphemes in Carstairs-McCarthy 1998.

and *ba-* for a class 14 possessum in (30c). The noun *tombi* ‘girl’ is itself of class 9/10PL and this is reflected by the medial prefix *-izin-* in both examples. This straightforward division of labour between the two prefixes is marred in one case, however. When the stem noun of the possessor is of Class 1a/2a (e.g., *u-tisha* ‘1a-teacher’) both prefixes undergo allomorphy. The class prefix becomes *-ka-* and more importantly the concordial prefixes are selected from a different (though clearly related) set. For example, the *za-* concord for a 10PL seen in (30b) and (31a) is replaced by *zi-* in (31b).<sup>44</sup>

- (31) a. *izin-tombi za-kwaZulu*  
           9/10PL-girl 9/10PL-Zululand  
           ‘the girls of Zululand’  
       b. *izin-tombi zi — ka — thisha*  
           9/10PL-girl 9/10PL 1a/2a:POSS teacher  
           ‘the teacher’s grils’

Assuming Carstairs 1987’s account of the Zulu facts to be correct, they clearly involve the type of inwards-sensitivity admitted by the theory as presented in section 2 and thus do not distinguish between the proposals.

Where the theories differ is in the treatment of morphosyntactic features (in the sense used here, i.e., features with syntactic relevance such as agreement or tense). Here, I will continue to keep two issues distinct: whether or not such sensitivity may be outwards, and whether or not it must be (i.e., may not be inwards). While I claim that it must be outwards, Carstairs appears to claim that it must be inwards. Note though that the second half of the Peripherality Constraint in (29) introduces an important qualification, admitting of some outwards-sensitivity for syntactic features (i.e., as allowed by the separation hypothesis). Digesting the terminology, the essence of the quote is this: outwards sensitivity is barred for particular features (such as specific person/number combinations, or particular tenses) but is admitted for classes of features. The Zulu examples above illustrate this as well: the class marker for class 1a/2a nouns (singular *u-* plural *o-*) becomes *ka-* whenever the noun is used as a possessor. Since the mark of being a possessor (i.e., the concordial prefix) is more peripheral, this counts as outwards-sensitivity (even when the concordial prefix is phonologically null). However, the *ka-* allomorph does not violate (29) due to the addendum cited: the factor triggering the *ka-* allomorph is not any particular feature of possessed nouns, but is rather the presence (as opposed to the absence) of the category “concordial.” Carstairs thus admits of some outwards-sensitivity for syntactic features, and given the wording of (29), the distinction

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<sup>44</sup> Carstairs argues crucially that there is no phonological account of this in Zulu, as opposed to the cases in (30) which involve an apparently regular phonological contraction process of /a+i/ to [e] (p.157). This data raises again the question noted in fn. 17: is this truly non-adjacent sensitivity, or is there a sort of transitivity effect in which the concordial prefix is sensitive only to the class prefix which is in turn sensitive to the stem. The answer seems to have no bearing on the immediate issue, though.

between our theories must therefore be at the level of the way in which individual morphosyntactic features may be visible to more central allomorphy.

It is important to note that Carstairs 1987 leaves open the question of why outwards-sensitivity may only be “vague,” i.e., only for the presence or absence of particular categories of features (in other words, the Peripherality Constraint does not follow from anything more general). In leaving this open, his claim must be taken as a proposed empirical generalization. I submit that the generalization is imperfect, given the examples above from Itelmen (and perhaps Bulgarian, and Yakkha in fn. 21). In addition, as I have attempted to show, by replacing Carstairs’s generalization in (29) with those I have attempted to motivate, we may be led to an answer to the deeper question of why the constraints on outwards- (and inwards-) sensitivity are the way they are.

Finally, we return to the third part of the claim motivated here. That is, (29) differs from the generalizations I have proposed here in that the former (like the theories of Halle & Marantz 1993, Noyer 1997) admits of inwards-sensitivity for syntactic features, leaving the Itelmen asymmetries as mysterious. In contrast to the previous point, Carstairs is arguing that something is possible which I hold to be impossible, and thus we may consider the concrete examples he has given to support his position. It is important to note from the outset that all the examples he adduces of apparent inwards-sensitivity for syntactically relevant features involve adjacent morphemes. I have tried as much as possible to avoid such environments as there may be additional complexities, and indeed, I have suggested elsewhere (e.g., Bobaljik 1999a) that adjacent morphemes escape the conditions set out in section 2. It has subsequently come to my attention that this “loophole” may not be necessary, and in particular, that one of the key examples motivating the adjacency loophole is apparently misanalysed. Before concluding the paper, I will present the relevant case and considerations briefly here, drawing heavily on work by Jeff Good and Alan Yu (see, e.g., Yu & Good 1999).

One of the most striking cases of inwards-sensitivity among affixes for (morpho-) syntactic features comes from Turkish inflection, as only partially illustrated in (32) (“A” and “B” are arbitrary designations for the purposes of exposition only).

(32) Turkish (Carstairs 1987:156): *gel-* ‘to come’

<i>gel-</i> ‘come’	Paradigm A (Aorist Simple)	Paradigm B (“ <i>di-</i> ”-Past Simple)
1SG	<i>gel-ir-im</i>	<i>gel-di-m</i>
2SG	<i>gel-ir-sin</i>	<i>gel-di-n</i>
3SG	<i>gel-ir</i>	<i>gel-di</i>
1PL	<i>gel-ir-iz</i>	<i>gel-di-k</i>
2PL	<i>gel-ir-siniz</i>	<i>gel-di-niz</i>
3PL	<i>gel-ir-ler</i>	<i>gel-di-ler</i>

The inflected Turkish verb consists of a root, followed first by a tense marker ( *-ir-* in the Aorist and *-di-* in the Past) and, more peripherally, an agreement morpheme. Note that there is some variation in the surface form of the actual agreement suffixes. This

variation is only partially attributable to phonological considerations. Most strikingly not phonological in nature is the difference between the 1<sup>st</sup> person plural agreement suffixes, *-iz* and *-k*. The choice among paradigms is straightforwardly determined by tense, with the endings of what I call “paradigm B” used in the simple past (marked by *-di-*) and the conditional (marked by suffix *-(y)SE-*) (Yu & Good 1999:1). Carstairs 1987 presents this data as a straightforward case of inwards-sensitivity for morpho-syntactic features (tense), hence a problem for the theory developed here (and for which, as noted, a loophole invoking adjacency is invoked in Bobaljik 1999a).

It turns out, though, that attributing the choice among paradigms to simple allomorphy—i.e., selection of one form of an abstract morpheme or another conditioned by the context in which it appears—is inadequate; an important observation due to Yu & Good 1999. In fact, the two paradigms differ systematically in Turkish in a number of ways, pointing to the conclusion that one set (paradigm B) are true agreement suffixes, while the other set (paradigm A) are actually clitics with, therefore, a rather different connection to the stem. Yu & Good 1999 give a range of evidence to support this conclusion, including the facts that (i) the paradigm A forms are used not only with verbs, but also with other, non-verbal predicates, whereas the B-paradigm endings cannot be, (ii) the A-paradigm forms escape the otherwise word-final regular stress, while the B-paradigm forms may bear the inflected verb’s main stress, and perhaps most strikingly (iii) the putative clitics in paradigm A may occur outside of a coordination, while the paradigm B as true affixes may not:<sup>45</sup>

- (33) a. [[ev-e            gel-ir]            [sana            [yardım ed]-er]] **-iz**  
           home-DAT    come-AOR    you:DAT    [“help”]-AOR    -1PL  
           ‘We will come home and ((we) will) help you’
- b. [[ev-e            gel-di-\*(k)]            [sana            [yardım et]-ti]] **-k**  
           home-DAT    come-PAST-1PL    you:DAT    [“help”]-PAST    -1PL  
           ‘We came home and then we helped you’    (Yu & Good 1999:5)

Yu & Good 1999 demonstrate that the differences between the two paradigms run much deeper than simply the choice of one of two phonological strings to represent a set of features (e.g., *-iz* or *-k* for [1PL]). The differences appear to involve a choice between clitics and inflected verbs. While a theoretical account is of course needed, the observations suggest quite strongly that the Turkish data do not obviously bear on the issue of inwards- versus outwards-sensitive contextual allomorphy.

In sum, while the Peripherality Constraint appears at first to differ strikingly from the proposals put forth here, I have noted here that the clearest evidence offered in favour of

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<sup>45</sup> Paraphrases altered slightly, with thanks to Meltem Kelepir and Ayşe Gürel. “Help” is glossed in quotes as the construction involves a nominal plus a “light” verb which together correspond to the English verb ‘help’. Yu & Good 1999 also note that there is variability in the order of the affixes in Turkish (Paradigm B relative to other verbal suffixes) while the clitics (Paradigm A) are rigidly word-final. Affix order variability poses intriguing problems, lying outside the scope of the present paper.



the PC involves arbitrary diacritics such as Class membership, and is thus not only consistent with the assumptions in section 2, but allows that part of the PC to be derived from these assumptions. Where the PC and my proposals differ is only with respect to morphosyntactic features, and for these, there seems to be *prima facie* evidence in both directions. Cases considered in this paper argue that sensitivity for such features may be outwards (even for particular feature-values) contra (29), while (29)'s claim that such sensitivity may be inwards seems to be supported by examples like the apparent allomorphy in Turkish agreement paradigms. I have argued, though, that an alternative analysis for Turkish is not only available, but in fact is motivated by the observations in Yu & Good 1999: the alternation is not simple allomorphy. It remains to be seen, as noted at various points in this paper, whether or not such alternatives may be motivated for other cases of apparent inwards-sensitive allomorphy discussed not only in Carstairs 1987 but elsewhere in the literature.

## 5 Conclusions

My aim in this paper has, in a sense, been to begin where the quote in the introduction from Carstairs-McCarthy 1992 left off. That is, I have taken a strikingly complex system of contextual allomorphy—the situation in which the form of one morpheme depends on the features of the morphemes around it—and attempted to understand observed asymmetries in this system in a systematic way. In doing so, I have sought an answer not only to the question (1) with which we began *Under what conditions may one morpheme condition allomorphy another morpheme?* but also to the question *Why is allomorphy constrained by these conditions and not others.* I hope to have shown that the asymmetries in Chukotko-Kamchatkan inflectional allomorphy are systematic, and that the accurate description of this systematicity requires the distinction between morpho-syntactic and morpho-phonological features. The former may serve as the context only for outwards-sensitive allomorphy, and the latter may serve as the context only for inwards-sensitive allomorphy. While these generalizations may be added in to many theories of morphology, I have explored the possibility that one constellation of independently-motivated assumptions (i.e. those listed in (3)) may make the extra contribution of explaining these generalizations, as the generalizations follow from the broad assumptions directly. Such is not obviously true of current alternatives, including (29). In this light, I have sought to examine some of the previously attested (hopefully apparent) counter-examples to the theory I have put forth, and hope to have shown that there is at least an initial plausibility to the approach advocated here. A number of questions have been left open, and by no means have all potentially problematic cases been addressed. In a manner which I hope to have made rather explicit, the theory developed in section 2 is a theory of (a set of) empirical generalizations—the theory then is clearly explanatory only to the extent that the generalizations it derives are accurate. Here, I have but scratched the surface of the complexities of the topic and hope only to have shown the form that an explanatory theory might take if, contrary to popular misconception, morphology is indeed a systematic component of grammar.

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