Lingít (Tlingit) portmanteau allomorphy requires Fusion[1]

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Within Lingít (Tlingit), the morpho-phonological exponents of perfective aspect and subject agreement are often "combined" with surrounding prefixes into a single portmanteau morph. I present an analysis of this system whose unique advantages rest upon its use of Fusion operations. The conceptual advantages of the analysis demonstrate that if one looks beyond the "phonological appearance" of the alternations in question, and considers the morpho-syntactic features being combined, one can begin to see generalizations and connections that are otherwise hidden.

1 Portmanteau allomorphy in the Lingít verbal prefix string

Lingít is a Na-Dene language spoken in Alaska and British Columbia.[2] Like its distant relatives in the Athabascan family, verbal inflectional and derivational morphology is almost exclusively prefixal, and comparatively complex rules of contextual allomorphy can serve to drastically alter the underlying phonological form of the verbal prefixes. Certain of these alternations are given a constraint-based analysis in Cable (2004).

Other alternations, however, appear to defy serious phonological analysis; this is especially the case with the aspectual and subject agreement morphemes. For certain combinations of subject agreement and aspect features, the phonological realizations of those features on the Lingít verb is a form that is not derivable from the usual underlying forms of the prefixes and the general phonology of the verbal prefix string. The targeted patterns of allomorphy may be described by the rewrite rule system in (1). The appendix to this paper collects a number of textually attested forms illustrating most of these alternations.

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[2] Throughout this paper, I restrict my discussion to the Northern dialect of Lingít. Its morpho-phonological differences from the Southern dialect are not of consequence to the analysis put forth here.

(1) Coalescence Phenomena (adapted from Story 1966, Leer 1991)

Morphemes Involved:	Rewrite Rules:[3]		
wu 'perfective'	a. wu + ya	→	woo
ee 'second person singular subject'	b. wu + ee	→	yi
ya 'null series classifier, +I, -D'[4]	c. wu + ee + ya	→	yee
yi 'second person plural subject'	d. yi + ya	→	yeey
Ci '(any) non-null series classifier, +I'[5]	e. yi + Ci	→	yeeyCi
	f. wu + yi	→	yeey
	g. wu + yi + ya	→	yeey

When presented with this set of facts, one's natural inclination is to further simplify the system, perhaps by viewing some of the more complex alternations (1c, 1g) as the mere composition of some of the simpler ones. Before I present one proposal for doing just this, let us consider whether it is profitable to view the alternations above as lying within the phonological system of the language. After all, some of the alternations in (1) seem as if they might have a natural phonological basis (e.g. (1b)).

Despite the initial plausibility, however, it is probably best not to view these rules as forming a part of Lingít phonology. There are two facts which point to this conclusion. The first is that some of the coalescence alternations in (1) fail to apply under a number of *morpho-syntactically* specified conditions. That is, there are certain conditions under which some alternations in (1) do not apply; these conditions do not form a phonologically natural class, though they do form a morpho-syntactic natural class. Section 4 will discuss these facts in greater detail. The reader will see that a phonological construal of the alternations in (1) would have to assume they are sensitive to morpho-syntactic properties of the word that would not normally be visible to the phonology.

The strongest reason to avoid a phonological analysis of these alternations, however, is that no such analysis would succeed in simplifying the statements in (1). For example, consider alternation (1c). Might it be possible to view (1c) as the composition of some of the other alternations in (1)? Under a phonological construal of the alternation, this is impossible. First, note that the sequence *yi – ya* surfaces as *yeey* (rule (1d)). Thus, (1c) cannot be the composition of (1d) and (1b). Next, note that the sequence *ee – ya* otherwise surfaces as *iya* , via a regular shortening rule. Thus, alternation (1c) cannot be due to the application of some other rule in (1) to the phonological realization of *ee – ya*. The reader, of course, is invited to attempt more sophisticated phonological analyses of these alternations; the present author, however, has become frustrated in his attempts.

Although the system in (1) does not submit to phonological analysis, I will argue in the following sections that insight into its nature can be gained if we ignore its phonological appearance and pay closer attention to the morpho-syntactic features being combined.

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[3] These rules are understood to apply when the morphs in question are directly adjacent.

[4] For explanations of the terms 'null series', 'non-null series' '+/-D' and '+/-I' in the context of Lingít verbal classifiers, see Leer (1991; section 4.1.1).

[5] This description encompasses the following classifiers: *si, dzi, li, dli, shi, ji*

2 Towards a Morpho-Syntactic Analysis

As a first step towards a more syntactic analysis of this system, let us note that half the 'rules' in (1) have the form *yeey* as their output. This is despite the wildly differing phonological and morphological properties of the assumed underlying forms. Indeed, the distribution of *yeey* tends to stymie a phonological analysis of (1). One might gather from this heterogeneous distribution that the form *yeey* is a morphological 'default' (Bonet 1995, Halle & Marantz 1993), a morpheme which surfaces when the underlying morpho-syntactic features cannot be mapped to any more specific phonological form. If we pursue this conception of the distribution of *yeey*, it will be possible to avoid a heterogeneous set of rules governing its appearance, such as appears in (1).

The system to be presented below is one that adopts this conception of *yeey*. It is divided into two components: a set of Fusion Rules governing the combination of morpho-syntactic nodes, and a set of Vocabulary Rules governing the mapping between morpho-syntactic nodes and phonological form.

2.1 Fusion Rules

In this and the following section I make clear some of the architectural assumptions underlying the proposed formal analysis.[6] The morphological system is conceived of as taking as input a structure composed purely of morpho-syntactic features. Thus, the input to morphology is conceived of as a structure such as that represented in (2).

(2) [[[1st person] [plural]] [[imperfect, 3rd]]]

These structures are then manipulated and altered by various structure-changing operations internal to the morphology. One of these operations is Fusion. Fusion combines two sets of morpho-syntactic features (Halle & Marantz 1993). It is defined as in (3).

(3) <u>Fusion</u>:
(a) the result of Fusion to feature sets A, B is the union of A and B
(b) Fusion can only apply to feature sets that are directly adjacent.

An illustrative morphological derivation employing Fusion is offered in (4). Note that Fusion of a node A containing features (a, b, c, d) and a node B containing features (e, f, g, h) produces a node C containing all eight features.

(4) INPUT $[_A$ a, b, c, d] $[_B$ e, f, g, h]
FUSION of A and B $[_c$ a, b, c, d, e, f, g, h]

With this definition of Fusion in place, we can state the morpho-syntactic rules in (5).

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[6] For more details regarding 'distributed morphologies', see Halle & Marantz (1993), Harley & Noyer (1999). For reasons of space, I make here a number of simplifications (particularly regarding Fusion) that may distress savvy readers.

(5) a. [Perf] and [AgrS, 2nd] are Fused
b. [Perf] and [null, +I, -D] are Fused
c. [AgrS, 2nd, pl] and [null, +I, -D] are Fused

The content of these rules will be later clarified via illustrative derivations. For now, let me state that these rules contain *minimal* descriptions of the nodes targeted by Fusion. For example, rule (5a) states that if *any* node containing the feature 'Perf' and *any* node containing the features 'AgrS, 2nd' are adjacent, then they are Fused.

2.2 Vocabulary Rules

After Fusion and other structure-changing operations have applied, the resulting structure is assigned a phonological form. This form is largely dependent upon the language's set of 'Vocabulary Rules'. These rules are instructions for phonologically realizing particular morpho-syntactic feature combinations. A Vocabulary Rule can apply if its feature specification is *not inconsistent with* (i.e., is a subset of) the features on a given morpho-syntactic node. For example, of the two Vocabulary Rules in (6), only the second can apply to the input morpho-syntactic node.

(6)	INPUT		[AgrS, 2nd , sg, feminine]
	Vocab Rule 1: [Perf , 2nd, sg]	⇔ / yi /	(can't apply)
	Vocab Rule 2: [AgrS, 2nd, sg]	⇔ / ee /	/ ee /
	OUTPUT		/ ee /

In cases where more than one Vocabulary Rule may apply to a given node, a rule ordering – described presently – determines which applies.

The proffered set of Vocabulary Rules for Lingít are listed under (7).

(7)	a. [Perf , 2nd , sg , null , +I , -D]	⇔	/ yee /
	b. [Perf , 2nd, sg]	⇔	/ yi /
	c. [AgrS, 2nd, pl]	⇔	/yi / / ____[-I]
	d. [AgrS, 2nd , sg]	⇔	/ee /
	e. [AgrS]	⇔	/ yeey /
	f. [Perf , null , +I , -D]	⇔	/ woo /
	g. [Perf]	⇔	/wu /
	h. [null , +I , -D]	⇔	/ya /

The ordering of the rules in (7) is crucial for the correct operation of the system. It will usually be the case that a large number of Vocabulary Rules *could* apply to a given morpho-syntactic node. In such cases, the ordering of the Vocabulary Rules determines which of the competing Vocabulary Rules *does* apply to the node. Of the Vocabulary Rules that may apply to it, a given morpho-syntactic node undergoes that which appears highest in the ordering.

The reader will note that the ordering in (7) respects the standardly-assumed "Subset Principle" that a given Vocabulary Rule be ordered after all those whose morpho-syntactic specifications are supersets of its own. For more on the ordering of Vocabulary Rules, see the works cited in footnote 6.

3 Derivations within the distributed system

The system of Fusion Rules in (5) and Vocabulary Rules in (7) constitutes the proffered analysis of the portmanteau allomorphy in (1). In this section I will demonstrate how this system derives the correct portmanteau forms. Besides demonstrating the system's adequacy, the sample derivations will help illustrate how forms are calculated in a distributed system of this sort.

Let us begin by deriving the alternation in (1a): *wu + ya* → *woo*

(8)	[Perf] [null , +I , -D]	FUSE, by rule (5b)
	[Perf , null , +I , -D]	SpellOut, by rule (7f)
	/ woo /	

We assume that the morphology takes as its input the node containing the feature *Perfective* followed by the node containing the features *null, +I, -D*. Given this input, Fusion Rule (5b) then applies, creating a node containing all the features *Perfective, null, +I, -D*. At this point, no further structure-changing operations may apply, and the structure is sent on to the Vocabulary Rules. Vocabulary Rule (7f) is the first that may apply, spelling out the resulting node as the phonological form *woo*.

Let us next derive alternation (1c): *wu + ee + ya* → *yee*.

(9)	[Perf] [AgrS, 2nd , sg] [null , +I , -D]	FUSE, by rule (5a)
	[Perf , AgrS, 2nd , sg] [null , +I , -D]	FUSE, by rule (5b)
	[Perf , AgrS, 2nd , sg , null , +I , -D]	SpellOut, by rule (7a)
	/ yee /	

We now assume that the input is the node containing *Perfective*, followed by the node containing *AgrS 2nd sg*, followed by the node containing *null, +I, -D*. To this input, Fusion Rule (5a) – and no others – applies.[7] The result is that the first two nodes in the sequence are fused together. To this output, Fusion Rule (5b) can now apply. The result is that all features are Fused together into a single node. No other Fusion Rules can apply, and so the node is sent to the Vocabulary Rules. Of the Vocabulary Rules in (7), the first that may apply is rule (7a), and so the output phonological form is *yee*.

A rather complicated case is alternation (1g): *wu + yi + ya* → *yeey*. Our system provides us four ways of deriving this alternation.

(10)	[Perf] [AgrS, 2nd , pl] [null , +I , -D]	FUSE, by (5a)
	[Perf , AgrS, 2nd , sg] [null , +I , -D]	FUSE, by (5b) or (5c)
	[Perf , AgrS, 2nd , sg , null , +I , -D]	SpellOut, by (7e)
	/ yeey /	
	[Perf] [AgrS, 2nd , sg] [null , +I , -D]	FUSE, by (5c)
	[Perf] [AgrS, 2nd , sg , null , +I , -D]	FUSE, by (5a) or (5b)
	[Perf , AgrS, 2nd , sg , null , +I , -D]	SpellOut by (7e)
	/ yeey /	

[7] Rule (5b) cannot apply yet since the nodes in question are not yet directly adjacent.

I will talk the reader through one of the four derivations above; I assume that the graphical representation in (10) will render the other three clear enough. We assume that the input to morphology is the node containing *Perfective*, followed by the node containing *AgrS 2nd pl*, followed by the node containing *null, +I, -D*. To this input, Fusion Rule (5a) may apply, joining together the first two nodes in the sequence. Subsequently, Fusion Rule (5c) can now apply. The result is a single node containing all the features *Perf, AgrS 2nd pl, null +I –D*. To such a node, rule (7e) is the first Vocabulary Rule that can apply.

I will assume that it is now clear how derivations within this distributed morphology operate. Below I present the derivations the system provides for the other portmanteau allomorphs in (1), without accompanying prose.

(11) Alternation (1b): *wu + ee → yi*

[Perf] [AgrS, 2nd , sg]	FUSE, by rule (5a)
[Perf , AgrS , 2nd , sg]	SpellOut, by rule (7b)
/ yi /	

(12) Alternation (1d): *yi + ya → yeey*

[AgrS, 2nd, pl] [null , +I , -D]	FUSE, by rule (5c)
[AgrS , 2nd , pl , null , +I , -D]	SpellOut, by rule (7e) .[8]
/ yeey /	

(13) Alternation (1e): *yi + Ci → yeeyCi*

[AgrS, 2nd, pl] [s/l/sh , +I , -D]	SpellOut, by rule (7e) [9]
/ yeey /[s/l/sh , +I , -D]	SpellOut, by whatever [10]
/ yeey / / Ci /	

(14) Alternation (1f): *wu + yi → yeey*

[Perf] [AgrS , 2nd , pl]	FUSE, by rule (5a)
[Perf , AgrS , 2nd , pl]	SpellOut, by rule (7e)[11]
/ yeey /	

The derivations in (10), (12) – (14) illustrate the way in which the morpheme *yeey* behaves as a 'default' within this system. The morpho-syntactic content of *yeey* is highly underspecified – all it signifies is the presence of subject agreement features. Its heterogeneous distribution is a direct result of its highly underspecified content, given the logic of the Subset Principle.

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[8] Rule (7c) cannot apply because its environmental condition is not met; the node is by necessity not adjacent to a –I classifier. The rule ordering in (7) entails that (7g) be used.

[9] No Fusion Rule can apply since the classifier is not of the null series. Moreover, rule (7c) again cannot apply because the node is not adjacent to a –I classifier.

[10] Note that a left-to-right application of the Vocab Rules is required to derive forms with the 2nd pl prefix *yi*. Happily, there are no cases in which a right-to-left application of the Vocab Rules is essential to derive the correct output form. Given the evidence that the prefix string in a Na-Dene verb is leftward branching (Rice 2000), this provides additional evidence that Spell-Out proceeds in a bottom-up fashion (see Bobaljik 2000).

[11] Rule (7c) cannot apply because the perfective prefix selects for a +I classifier. Hence, its environmental condition is never met.

4 A Critical Complication

Thus far, we have seen that the system of Fusion Rules in (5) and Vocabulary Rules in (7) are sufficient to derive the pattern of allomorphy in (1). Besides being empirically adequate, this analysis captures the complex distribution of *yeey* by assigning it a single, highly underspecified environment. In addition, this morpho-syntactic analysis receives further support from a curious set of conditions governing the portmanteau forms in (1).

Interestingly, alternations (1a) and (1c) do not apply under certain morpho-syntactically specified conditions. Under these conditions, alternation (1a) is replaced with alternation (1a') and alternation (1c) is replaced with alternation (1c').

(1a') wu + ya → uwa

(1c') wu + ee + ya → iya

The conditions under which (1a') and (1c') apply are the following.

(15) The Conditions Requiring Rule Alternates (1a') and (1c') [12,]

a. The verb is a member of the 'first conjugation'; its conjugation marker ('aspect prefix' in the terminology of Leer 1991) is the null prefix. [13]

Example:
Ách áyá a ká-t aa **wu-ya-.át → uwa.át** [14]
so foc it top-to part. perf-cl-go
So they started over it. (Dauenhauer & Dauenhauer 1987; p. 68)[15]

b. The perfective (*wu*) is directly preceded by an incorporated noun.

Example: (compare to example (26b) in Appendix)
…yoo haa **ka-wu-ya-néi → kaawanéi** [16]
part. us top-perf-cl-do
It happened to us. (D&D 1987; p. 82, line 3)

c. The perfective is directly preceded by one of the following object agreement prefixes: second singular (*i*), second plural (*yee*), fourth (*ku*), third obviative (*a*). [17]

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[12] See Leer (1991; p. 177, 178, 185 - 202) and Story (1966; p. 115, 117).
[13] Such verbs are referred to as 'Telic' by Leer 1991, the complement of this class being 'Atelic'. These verbs are referred to as 'K-Paradigmatic' by Story 1966, the complement of this class being 'L-Paradigmatic'. The term 'first conjugation' is introduced in Story & Naish (1973; p. 379).
[14] In many places, the glosses I offer here are rather rough and oversimplified.
[15] For reasons of space, I will henceforth use 'D&D' to abbreviate these authors' names.
[16] A regular process of hiatus avoidance produces this surface form from the underlying form 'ka-uwa-nei'.

Example: (compare to example (26b) in Appendix)
Wáa sáyá **i-wu-ya-nei** → **eewanei** [18]
how foc you-perf-ya-do
What happened to you? (D&D 1987; p. 124, line 28)

Although these facts seem daunting at first, it will eventually be shown that they provide crucial evidence supporting our morpho-syntactic analysis. In brief, it will be argued that the morpho-syntactic analysis provides more insight into the nature of these interesting irregularities than any phonological analysis.

Let us begin by asking two questions regarding the 'rule replacement' described in (15). The first question is "Why should all and only rules (1a) and (1c) be replaced in the environments specified? Why should these two rules behave as a class?" The second question is "What commonalities unite the set of conditions in (15)? What, for example, do the prefixes in (15c) have in common such that all induce use of rules (1a') and (1c')?" Ultimately, an account that can offer answers to these questions is more promising than one that cannot.

Consider now a phonological construal of the alternations in (1). What sort of answer could such an analysis provide to our first question? Unfortunately, it seems that no answer is forthcoming. After all, there don't seem to be any *phonological* properties that unite alternations (1a) and (1c) to the exclusion of all the other alternations. Although both (1a) and (1c) involve the prefixes *wu* and *ya*, they aren't the only alternations to do so; consider alternation (1g). It's also rather unclear what phonological 'operations' the two alternations might exclusively share. Although it is not possible to prove a negative here, it remains rather difficult to see how alternations (1a) and (1c) can fall out as a natural class under a purely phonological construal of them.

Let us now ask what answer a phonological analysis of (1) might provide to our second question. Again, it seems that no answers are forthcoming. The prefixes in (15c) are not a phonologically natural class. The only phonological property that *i*, *yee*, *ku* and *a* have in common is that they are open syllables. However, there are other object agreement prefixes occupying the same 'templatic position' as those in (15c) that constitute open syllables, and which do *not* require the use of (1a') and (1c') – for example, the first person plural object agreement prefix *haa*. Once again, under a phonological analysis it remains unclear why the entities appealed to in (15) should group together.

It is thus doubtful that a phonological analysis of (1) could provide answers to our two questions regarding (15). On the other hand, some progress on these questions can be made if we adopt the morpho-syntactic analysis developed in section 2. First of all, there immediately springs to mind a property uniting alternations (1a) and (1c): *these two alternations are the only ones to crucially rely upon Fusion Rule (5b).* A quick inspection of the

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[17] Prior authors have referred to the *a* prefix as 'non-focal'. Leer (1993) notes that the contrast between this prefix and the 'focal' 3rd Agr O (*ash*) seems quite similar to that between so-called 'obviative' and 'proximate' agreement in other languages. There are, however, other agreement prefixes that *a* contrasts with, which complicates its full analysis. See Leer (1993) for a rich discussion of the uses of these prefixes.

[18] Hiatus avoidance produces this surface form from the underlying form 'i-uwa-nei'.

derivations in section 3 reveals that our morpho-syntactic system cannot derive either alternation (1a) or (1c) if appeal to rule (5b) is prevented, and that *no other alternation has this property*.

Let us, then, entertain the notion that the appearance of alternations (1a') and (1c') results from the inability for Fusion Rule (5b) to apply when the conditions in (15) obtain. Such an account would derive that the conditions in (15) would only affect the alternations in (1a) and (1c), and so would provide an interesting answer to our first question.

In the next section, we will develop in detail this nascent analysis of the 'rule-replacement' in (15). This extension of our morpho-syntactic analysis will provide answers to both our questions above, questions which seem to stymie any phonological analysis of the alternations. On these grounds, our full, final morphosyntactic analysis will be the superior account of the allomorphy in (1).

5 The Morpho-Syntactic Analysis of the 'Rule-Replacement'

Let us begin by amending the Fusion Rules so that they read as follows.

(16) a. [Perf] and [AgrS, 2nd] are Fused
b. [Perf] and [null, +I, -D] are Fused *unless* [Perf] is adjacent to:
(i) [N]
c. [AgrS, 2nd, pl] and [null, +I, -D] are Fused

Under the assumption that the appearance of alternations (1a') and (1c') is ultimately due to the 'suspension' of the Fusion operation in (5b), the 'unless' condition in (16b) directly builds into our system the sensitivity of the rule replacement to condition (15b). This will be seen in greater detail later on.

Consider now condition (15c). We have seen that a phonological analysis cannot characterize as a natural class the prefixes appealed to in condition (15c). Interestingly, when we turn our attention to the morpho-syntactic features of these prefixes, we find that they *are* a natural class with respect to those features. Note that the prefixes listed in (15c) are all the object agreement prefixes *except* for 1st person singular *x̲at*, 1st person plural *haa*, and proximate third *ash*.[19] Why should first person prefixes group together with proximate thirds? Let us adopt the notion that first person prefixes in Lingít are inherently 'proximate'. It is well known that, in languages witnessing obviative-proximate distinctions, local subjects tend to group together with proximates. Algonquian, for example, has many well-known instances of this. Indeed, Halle & Marantz (1993) explore the possibility that local persons are obligatorily marked as 'proximate' in Potawatomi. Regarding languages within the Na-Dene family, Rice (2000; p. 220) notes that local persons in Athabascan languages appear to be 'inherently topical.' Adopting the position that first persons in Lingít are inherently topical/proximate, we might restate the condition in (15c) to "the perfective is directly preceded by a *non*-proximate

[19] Other prefixes occupying the same 'templatic position' as these seven include reflexive *sh*, indefinite object *at* and partitive object *aa*. It may be that these prefixes do not bear any 'topic' features – either positive or negative – and so would also be expected under (17) not to require use of alternations (1a') and (1c').

object agreement prefix".[20] We might incorporate this version of condition (15c) into our Fusion Rules by making the following amendment.

(17) a. [Perf] and [AgrS, 2nd] are Fused
b. [Perf] and [null, +I, -D] are Fused *unless* [Perf] is adjacent to:
(i) [N] ; (ii) [- Topic]
c. [AgrS, 2nd, pl] and [null, +I, -D] are Fused

At this point, however, the reader might note an interesting redundancy within condition (17b). Recall that one of the effects of noun-incorporation on discourse-structure is the *de*-topicalization and *backgrounding* of the information contributed by the noun (Mithun 1999; p. 46). Incorporated Ns are thus by necessity non-topical, and statement (17bii) can be made to cover (17bi).

(18) a. [Perf] and [AgrS, 2nd] are Fused
b. [Perf] and [null, +I, -D] are Fused *unless* [Perf] is adjacent to:
(i) [- Topic]
c. [AgrS, 2nd, pl] and [null, +I, -D] are Fused

We find, then, that our morpho-syntactic analysis of (1) – unlike a phonological analysis – can provide an interesting answer to the second of our questions in section 4. Conditions (15b) and (15c) ultimately reduce to a single condition requiring (1a') and (1c') when [Perf] follows material marked as [- Topic].

Finally, let us turn our attention to condition (15a). Our guiding 'intuition' requires that the conjugational class of a verb be able, somehow, to interrupt the Fusion of [Perf] and [null +I –D]. Some insight into the exact mechanics of this interaction can be gained by considering the 'morphological template' of the Lingít verb.

(19) Portion of the Lingít Verbal Prefix Template (based on Leer 1991)

…AgrO-IncorpN-Conjugation1-Irrealis-Conugation2-Aspect-Dist-AgrS-Class
{ ga } { u } { na, ga, Ø } { wu }

Following the proposals in Leer (1991), the null, first-conjugation prefix 'Ø' always appears in a position directly preceding the position of the perfective prefix.[21] Therefore, we might assume that in first conjugation verbs, the node containing the feature [Perf] is always adjacent to a node containing the feature

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[20] Of course, this proposal begs the question why *second* person is not treated by Lingít as inherently proximate. One answer might be that this fact simply reflects the tendency for the 'animacy hierarchy' to differ slightly across languages (Comrie 1989; chapter 9).

[21] The motivation for placing the null prefix in this position is not strong. Leer (1991) notes that the three prefixes occupying our 'Conjugation2' are in complementary distribution. This argument, however, is weakened by the fact that each of the Conjugation2 prefixes is also in complementary distribution with the prefix *ga*, in the Conjugation1 position. Neither Story (1966) nor Story & Naish (1973) recognize a null conjugation prefix, only a conjugation class that is not signaled by a formal prefix.

[Conj 1st].[22] We might then incorporate condition (15a) into our formal system by amending Fusion Rule (18b) in the following way.

(19) a. [Perf] and [AgrS, 2nd] are Fused
b. [Perf] and [null, +I, -D] are Fused *unless* [Perf] is adjacent to:
(i) [- Topic] ; (ii) [Conj 1st]
c. [AgrS, 2nd, pl] and [null, +I, -D] are Fused

The 'unless' condition in rule (19b) has as its consequence that [Perf] and [null, +I, -D] *cannot* be fused when any of the conditions in (15) obtain. The result is that alternations (1a) and (1c) – and only those alternations – will fail to occur if and only if those conditions apply. Thus, our morpho-syntactic system is quite close to deriving the 'rule-replacement' introduced in section 4. As it is presently structured, however, our system does not produce the correct outputs when the conditions in (15) obtain. The following derivations illustrate.

(20) Alternation (1a'): {[-Top], [Conj 1st]}-wu-ya → {[-Top], [Conj 1st]}-uwa

{ [-Topic] , [Conj 1st] } [Perf] [null , +I , -D]	SpellOut by rule (7g)
{ [-Topic] , [Conj 1st] } / wu / [null , +I , -D]	SpellOut by rule (7h)
{ [-Topic] , [Conj 1st] } / wu / / ya /	Regular Phonology
{ [-Topic] , [Conj 1st] } / wu / / wa /	

(21) Alternation (1c'): {[-Top], [Conj 1st]}-wu-ee-ya → {[-Top], [Conj 1st]}-iya

{ [-Topic], [Conj 1st] }[Perf] [AgrS 2nd sg] [null +I -D]	FUSE, by (19a)
{ [-Topic], [Conj 1st] } [Perf AgrS 2nd sg] [null +I -D]	SpellOut, by (7b)
{ [-Topic], [Conj 1st] } / yi / [null +I -D]	SpellOut, by (7h)
{ [-Topic], [Conj 1st] } / yi / / ya /	

These derivations demonstrate that our system presently outputs *wuwa* instead of the correct output *uwa*, and *yiya* instead of the correct output *iya*. Note, however, that these incorrect outputs are tantalizingly close to the correct outputs. Indeed, all that is needed to convert them into the correct outputs is the rather simple rule of glide deletion in (22).

(22) Lingít Successive Glide Onset Deletion:
$[\ C_{glide}\ V\ ]_{\square}\ [\ C'_{glide}\ V\ ]_{\square}\ \rightarrow\ [\ V\ ]_{\square}\ [\ C'_{glide}\ V\ ]_{\square}$; where C = C'

This rule – possibly rooted in the OCP – deletes glides when they occupy the onset of a syllable followed by a syllable with an identical glide in its onset. If this rule is appended to the end of the derivations above, our system derives the correct outputs.

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[22] A potential complication arises from the fact that no verb of *any* conjugational class appears containing an overt conjugational prefix in its perfective mode. However, this might simply be due to a readjustment rule that requires all conjugational prefixes to surface as null in the environment of the feature [Perf].

(23) { [-Topic] , [Conj 1st] } [Perf] [null , +I , -D] SpellOut by rule (7g)
{ [-Topic] , [Conj 1st] } / wu / [null , +I , -D] SpellOut by rule (7h)
{ [-Topic] , [Conj 1st] } / wu / / ya / Regular Phonology
{ [-Topic] , [Conj 1st] } / wu / / wa / Glide Deletion
{ [-Topic] , [Conj 1st] } / u / / wa /

(24) { [-Topic], [Conj 1st] }[Perf] [AgrS 2nd sg] [null +I -D] FUSE, by (19a)
{ [-Topic], [Conj 1st] } [Perf AgrS 2nd sg] [null +I -D] SpellOut, by (7b)
{ [-Topic], [Conj 1st] } / yi / [null +I -D] SpellOut, by (7h)
{ [-Topic], [Conj 1st] } / yi / / ya / Glide Deletion
{ [-Topic], [Conj 1st] } / i / / ya /

Thus, we find that the amended system of Fusion Rules in (19), the system of Vocabulary Rules in (7) and the single rule of glide deletion in (22) is sufficient to derive the portmanteau allomorphy described in (1), as well as the specially conditioned, 'alternative' allomorphy described in section 4. [23]

6 Conclusion

Beyond its demonstrated empirical adequacy, the morpho-syntactic analysis we have developed here has several conceptual advantages over a purely phonological analysis of the alternations in (1). First, it is able to provide an elegant, unitary account of the seemingly heterogeneous distribution of *yeey* via postulation of a single, highly underspecified Vocabulary Rule. Secondly, it is able to characterize alternations (1a) and (1c) as a 'natural class', and can derive their exclusive sensitivity to the conditions specified in (15). Finally, it is able to capture many of the conditions in (15) under a single generalization, one that appeals to the morpho-syntactic features of the prefixes in question.

The portmanteau allomorphy of Lingít provides a particularly striking object lesson in the relevance of morpho-syntax to morpho-phonology. Here, as in so many other cases, if one looks beyond the phonological 'appearance' of the alternations, and considers the morpho-syntactic features being combined, one can begin to discover generalizations and connections that are otherwise hidden.

Appendix

These textual examples witness most of the alternations discussed above.

(25) Regular surfacing of *wu*

Jil<u>k</u>áat aa-<u>x</u> has **wu-si-tee** → **wusitee**
Chilkat it-of they perf-cl-be
They became Chilkats. (D&D 1987; p. 68, line 117)

[23] There is no independent evidence for this rule of glide deletion in Lingít. Nevertheless, Cable (2004) proposes the existence of several prosodic domains mapped to the Lingít verbal prefix string. It is, at least, reassuring to note that the rule in (22) may be consistently added to the phonology of one of those domains (the 'Inner Prefix Domain').

(26) Alternation (1a): *wu + ya* → *woo*

a. s'eenáa yaakw a<u>x</u> jee **yéi wu-ya-tee** → **yéi wootee**
seine boat my hand so perf-cl-be
I had a seine boat. (D&D 1987; p. 72, line 17)

b. kaawayí-x' **yóo wu-ya-nei** → **yóo woonei**
above-to part. perf-cl-do
They went into the air. (D&D 1987; p. 78, line 122)

(27) Alternation (1b): *wu + ee* → *yi*

wu-ee-si-kóo wéit'át koo<u>k</u>énaa → **yisikóo**
perf-2nd sg-cl-know thing messenger
You know what a messenger is. (D&D 1987; p. 232, line 286)

(28) Alternation (1c): *wu + ee + ya* → *yee*

sakwnéin **wu-ee-ya-<u>x</u>oo<u>x</u>** → **yee<u>x</u>oo<u>x</u>**
bread perf-2nd sg-cl-ask
You asked them for bread. (D&D 1990; p. 186, line 15)

(29) Alternation (1d): *yi + ya* → *yeey*

yeedát áwé **yi-ya-téen** → **yeeytéen**
now foc 2nd pl-cl-can.see
Now you can see. (D&D 1990; p. 176, line 18)

(30) Alternation (1e): *yi + Ci* → *yeeyCi*

wooch **yi-dzi-<u>x</u>án** → **yeeydzi<u>x</u>án**
recip. 2nd pl-cl-love
You care for each other. (D&D 1987; p. 104, line 456)

(31) Alternation (1f): *wu + yi* → *yeey*

wu-yi-si-kóo yee kaani yán → **yeeysikóo**
perf-2nd pl-cl-know your brothers-in-law
You all know your brothers in law. (D&D 1990; p. 238, line 66)

(32) Alternation (1g): *wu + yi + ya* → *yeey*

du jee-t **wu-yi-ya-tée** → **yeeytée**
his hand-to perf-2nd pl-cl-be
You gave it to him. (D&D 1990; p. 176, line 10)

(33) Alternation (1a'): *wu + ya* → *uwa*

(see section 4)

(34) Alternation (1c'): *wu + ee + ya* → *iya*

neil **wu-ee-ya-tée** → **iyatée**
house perf-2nd-cl-throw
You threw it in the house. (D&D 1987; p. 222, line 86)

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