# Nez Perce Stem Classes: Phonology or Allomorphy?

Paul Kiparsky

The suffix *-hiin* ∼ *-hiis* (AD148)
/ʔáala-híins/ *ʔala-híin* 'steam engine' ('fire-comitative'), Acc. /ʔáala-híins-ne/ *ʔala-híis-na*.
Also: the suffix *-kiin* ∼ *-kiis* (p. 148). [???]
the final derivational suffix always determines
Rude 1994 verbs ending in heavy syllables are nearly always C-stems (avoid superheavy syllables)

## 1 The C-class effect

Nez Perce verb stems and stem-forming suffixes are of two types, called the S-class and the C-class (Aoki 1970: 81). S-class morphemes interact phonologically with the rest of the word only by the general processes that apply to all Nez Perce words, including regular sandhi and vowel harmony. C-class morphemes interact in additional special ways with the initial segment of the following suffix. Recent studies concur in treating the resulting alternations as suffix allomorphy, conditioned by a lexically specified property of C-class stems (Aoki 1970, 1994, Crook 1999, Cash Cash 2004, Deal and Wolf 2016, henceforth cited as AG, AD, C, Cash, and D&W).

AG, AD and C simply encode the distinction between S-class and C-class verbs by a diacritic feature, in effect treating them as arbitrary conjugational classes. More recently Cash and D&W maintaned that the distinction is at least partly predictable from argument structure. This is a consequential claim because is is uncommon for allomorphy to access argument structure, and some theories of morphology cannot even deal with argument-structure conditioned allomorphy at all. Since Distributed Morphology represents argument structure syntactically, and makes syntactic structure visible to morphology, it could in principle handle it, perhaps by the admittedly controversial device of readjustment rules. Some lexicalist morphological theories, howver, including Minimalist Morphology (Wunderlich 1994, 1996; Kiparsky 2021), embrace a more modular view which does not countenance such dependencies. For them the issue becomes an important, not to say existential question.

I present evidence against both the conjugational view and the argument-structural view of the Nez Perce C-class/S-class divide (section 2), and resurrect Rude's 1985 suggestion that C-class stems end in an underlying /-n/, ignored by most subsequent researchers, and explicitly rejected by Crook 1999 on grounds that will be re-examined below. As reframed here in the framework of autosegmental phonology and stratal OT, the idea is that C-class morphemes end in a final FLOATING nasal – a nasal that is unaffiliated to a syllable in the lexical representation. The floating nasal is segmentalized as *n* in the phonological derivation where syllable strcuture constraints allow, otherwise it merges with a following consonant if possible, and if even that is precluded, it is deleted at the word level. This analysis reduces the apparent suffix allomorphy entirely to phonology. Floating nasals occur only in bound forms, specifically in verb stems and in suffixes, never in nouns or other free-standing items. They contrast with stable nasals, which are anchored to syllabic positions (C-slots) like other consonants. The structural distinction between them predicts the differences between their phonological behavior (section 3). The analysis presented here is consistent with the phonological constraint system worked

out in Kiparsky 2021, which was shown there to eliminate another theoretically problematic case of allomorphy. In particular, it extends the consonantal fusion processes uncovered there there to another set of cases (section 4), and confirms that the stem-level phonological derivation proceeds cyclically from the innermost stem outward (section 5).

The suffix alternations fit the profile of phonological processes in every way. They are confined to a single segment at the juncture between the C-class morpheme and the suffix that immediately follows it; outside of this small window nothing happens. Which mutation takes effect depends solely on the initial segment of the following suffix as follows: (1) if the suffix begins with a vowel or with a non-coronal consonant, *n* is inserted before it, (2) suffix-initial *s* undergoes fortition to *c-* (from which the stem classes get their name), and (3) a suffix that is a single consonant is replaced by *-n*. Only immediately following suffixes, derivational as well as inflectional, are affected, and only a single segment or feature of them. Prefixes, though interspersed with suffixes in the derivation, remain entirely unaffected. The syndrome of strict locality, phonological conditioning, and limitation to single segments and features is a hallmark of phonology, rather than of allomorphy.

The main generalizations are illustrated in (1)-(3). An *n* appears regularly between a C-class morpheme and a vowel-initial stem suffix:[1]

(1)

| | S-Class | C-Class |
|---|---|---|
| Indefinite Past | -ee | -n-ee |
| Irrealis | -uu’ | -n-uu’ |
| Conditional | -aaq | -n-aaq |
| Plural Habitual Perfect | -e’niik | -n-e’niik |
| Plural Habitual Remote | -e’niik-ne | -n-e’niik-ne |
| Plural Habitual Past | -a’nii-qa | -n-a’nii-qa |
| Passive Participle | -iṅ, -i’s- | -n-iṅ, -n-i’s- |
| ‘as something approaches’ | -úukini | -n-úukini |
| ‘as the object goes by’ | -aatk | -n-aatk |
| ‘away from’ | -áapii | -n-áapii |
| ‘following’ | -etwik | -n-etwik |
| ‘toward’ | -úu | -n-úu |
| ‘move about’ | -eeyik | -n-eeyik |
| ‘desiderative’, ‘prone to’ | -ipec | -n-ipec |
| ‘instrumental’ | -u’s | -n-u’s |
| ‘instrument’ | -e’s | -ṅ-es |
| ‘agentive’ | -’éet | -ṅ-éet |
| ‘agentive’ | -ewẏeet | -n-ewẏeet |
| ‘place of an action’ | -ées | -n-ées |
| ‘not’ | -(eẏ)’éeẏ | -ṅ-éeẏ |
| ‘benefactive’ | -eṅy-, -eṅi | -n-eṅy-, -n-eṅi- |

The underlying long vowel of Irrealis (a.k.a. Future) /-uu’/ is justified in Kiparsky 2021: 422. In the last four examples, the initial glottal stop of a suffix merges with the stem-final nasal into a glottalized

[1] Data from Crook 1999 (C), Aoki 1979 (AT), Aoki and Walker 1988 (AW), and Aoki 1994 (AD). By vowel harmony, /e/ (pronounced [æ]) and /u/ are respectively backed and lowered to /a/ and /o/ in words that contain /a/, /o/, or certain morphemes with the neutral vowel /i/. I follow the Nez Perce Practical Orthography in writing the glottal stop as ’ and the postvelar fricative as *x̂* (an allophone of /q/, as [-x] is of /k/). But since glottalized sounds are single segments, I write them as *ṅ, ṫ* etc. not as *n’, t’*. Authors vary in naming the grammatical categories: for example, *-u’* is called Future by Aoki, Prospective by Deal & Wolf, and Irrealis by Crook (whose nomenclature I generally follow). More important is that it is an aspect, and patterns with the Perfect(ive) as a stem-level suffix, unlike the word-level tense and cis/trans-locative affixes. Otherwise the exact nature of the morphological features are not critical to my argument.

consonant.[2] Many of these suffixes combine with others into suffix chains. For example, Irrealis *-u' ~ -n-u'* combines with Past *-qaa* into Irrealis Past *-o'-qa ~ -n-o'-qa*, and with Cislocative *-kum* into Irrealis Cislocative *-u'-kum ~ -n-u'-kum*, and this again combines with Past *-qaa* into Cislocative Past Conditional *-o̧kom-qa ~ -n-o̧kom-qa*. There are likely polymorphemic affixes among those listed in (1) and further below, but I will not venture to segment them further here.

The *n*-increment after C-class stems surfaces also before suffixes beginning with velar, postvelar, and labial consonants, as in (2). This too holds without exception. (2) lists the underlying forms; the output emerges from some phonology that I lay out in section §3.[3]

(2)

| | S-Class | C-Class |
|---|---|---|
| Translocative Perfect | -ki | -n-ki |
| Translocative Perfective | -ki-ke | -n-ki-ke |
| Cislocative Perfect | -m-s | -n-m-s |
| Cislocative Perfective | -m-e | -n-m-e |
| Cislocative Imperative Singular | -m-k | -n-m-k |
| Cislocative Imperative Plural | -m-tk | -n-m-tk |
| Habitual Past | -qaa-qa | -n(a)-qaa-qa |
| Habitual Remote | -qaa-na | -n(a)-qaa-na |
| Habitual Perfect | -q | -n-q |
| Past | -me | -n-me |
| 'straight through' | -qawN | -n-qawN |

After C-class stems, suffix-initial *s* is replaced by *c* (this is how C-class stems got their name):[4]

(3)

| | S-class | C-class |
|---|---|---|
| Incompletive Present | *-see* | *-cee* |
| Plural Incompletive Present | *-síi-x, -síin-* | *-cíi-x, -cíin-* |
| Translocative Incompletive Present | *-seen-ki* | *-ceen-ki* |
| Plural Translocative Incompletive Present | *-siin-ki* | *-ciin-ki* |
| Cislocative Incompletive Present | *-see-m* | *-cee-m* |
| Plural Cislocative Incompletive Present | *-síi-nm* | *-cíin-m* |
| Incompletive Past | *-sáa-qa* | *-cáa-qa* |
| Plural Incompletive Past | *-sii-qa* | *-cii-qa* |
| Cislocative Incompletive Past | *-sáa-m-qa* | *-cáa-m-qa* |
| Plural Cislocative Incompletive Past | *-síin-m-qa* | *-síin-m-qa* |
| Translocative Incompletive Past | *-sáa-n-qa-qa* | *-cáan-qa-qa (< /-ki-qa/)* |
| Plural Translocative Incompletive Past | *-síin-qi-qa* | *-cíin-qi-qa (< /-ki-qa/)* |
| Incompletive Remote | *-see-ne* | *-cee-ne* |
| Plural Incompletive Remote | *-sii-ne* | *-cii-ne* |
| Translocative Incompletive Remote | *-see-me* | *-cee-me* |
| Inabilitative | *-síi-may* | *-cíi-may* |
| Conditional | *-see-ṅeq* | *-cee-ṅeq* |

[2] I am not sure that glottalized sonorants are phonetically distinct from clusters consisting of a glottal stop plus a sonorant.

[3] Data from C102, C109-110, C120-122, C173. There do not seem to be any stem suffixes that begin with *-p*. Word-final /-q/ and /-k/ are realized as [-x̂], [-x].

[4] Examples from C106, C108-9, C121, C191. In AG *-see* was considered a bimorphemic combination of a class marker *-s* and a singular number suffix *-e*. More recently works have treated it as a monomorphemic suffix, labeled Indicative Present in AD, Incompletive Present in C, and Imperfective in D&W. Since I concur that it is an aspect category, I have changed the glosses on items cited from AD accordingly.

In the stem-class analysis, suffixes that can attach both to C-class morphemes and to S-class morphemes have two allomorphs: those in (1) and (2) have one allomorph with *-n* and another allomorph without it, e.g. *-ee* ∼ *-nee*, and those in (3) have one allomorph with *-s* and another allomorph with *-c*, e.g. *-see* ∼ *-cee*. What is suspicious in this analysis is that *every* stem suffix that begins with a vowel or with a noncoronal consonant has an allomorph with *n-* after C-class stems, and that *every* stem suffix that begins with *s-* has an allomorph with *c-* after C-class stems. If this is allomorphy, why does it operate so systematically and exceptionlessly?

To summarize: the C-class alternations look more like phonology than like allomorphy. They target natural classes of single phonological segments within a small local window, and operate across the board in each environment. Allomorphy normally traffics in arbitrary alternations that must be listed for specific suffixes and stems or for subclasses of them.

The rest of the article is organized as follows. Section 2 examines the Nez Perce lexicon and concludes that none of the proposed morphosyntactic correlates of the C-class/S-class distinction are valid. A phonological account is presented in section 3, and the article concludes in section 5 with evidence for cyclicity.

# 2 Are the C-class mutations conditioned by argument structure?

## 2.1 The issue

The material presented so far suggests that the Nez Perce C-class and S-class stems do not constitute conjugations, declensions, or paradigmatic sets of any kind. The distinction between them does not correlate with any word classes, inflectional or derivational features, or other morphological properties.

But Cash Cash (2004) and Deal and Wolf (2016) claim that there is a *morphosyntactic* distinction between them. According to them C-class and S-class stems are correlated with different argument structures, although they disagree on which.

## 2.2 Cash Cash (2004)

Cash proposes that C-class verbs are prototypically intransitives that describe *internally caused* eventualities – that is, eventualities that are brought about by some property inherent to their sole argument (Levin and Hovav 2005, Ch. 3), whereas S-class verbs describe externally caused eventualities. As an example of internal causation he cites the verb /siséew/ 'to drip, to leak', which is diagnosed as C-class by forms such as *hi-ssséew-ce* 'it is dripping, it is leaking' (a liquid, a container). Dripping and leaking are internally caused eventualities in the sense that they are caused by some property of the thing that drips or leaks (although that property itself may be caused by some other event, such as the deterioration of a seal, the rupture of a container, or the melting of a frozen block). The class of internally caused verbs is believed to include intransitive verbs that describe volitional actions, such as *play* and *speak*, emotional reactions, such as *blush* and *tremble*, non-voluntary emissions, such as *buzz, jingle, flicker, glitter, smell, stink, gush, ooze, drip*, and entity-specific changes of state "inherent to the natural course of development of the entities they are predicated of", such as *bloom* and *decay*. More generally, they could be characterized as intransitives that do not participate in the causative alternation, and whose sole argument bears a Theta-role other than "Theme", be it Agent, Experiencer, Source, or any of a large number of other roles too heterogeneous or verb-specific to have names of their own. This is the class of UNERGATIVE verbs (Levin and Hovav 2005, Ch. 4). In contrast, S-class verbs, which according to Cash describe externally caused eventualities, comprise transitive

and unaccusative verbs with Theme arguments. As examples he cites *kíwyek-se* 'I am feeding (mine)' and *ʔipaláhsa-sa* 'it is rising' (fog, smoke, cloud).

Levin and Rappaport Hovav's (1995) classification of verbs, and specifically the relation between the unaccusative/unergative and internal/external causation distinctions that they propose, are however not uncontroversial. Perlmutter (1978) had assigned verbs of internally caused entity-specific emission (such as *glitter* and *shine*) to the unaccusative class. Recent studies have even questioned whether there is any coherent distinction between internally and externally caused eventualities that could underpin, or even just correlate with, the syntactic bifurcation into unergative and unaccusative predicates. The semantic/thematic category of internal causation that has been claimed to cue C-class allomorphy has never been clearly defined, and Rappaport Hovav 2020 now maintains that verbs of internal causation do not even constitute a grammatically coherent class. Moreover, predicates of the type *thicken* and *shrink* are arguably ambiguous between internal and external causation, e.g. *the gravy thickened overnight* vs. *flour thickens gravy*). Tying C-class status to internal causation would predict that such ambiguous predicates in Nez Perce alternate between these classes depending on which of these meanings they convey, but no such cases are found in Aoki's massive dictionary.

The larger issue is that the unaccusativity/unergativity distinction itself is not crisply defined. The various syntactic diagnostics of unaccusativity (such as Italian *ne*-cliticization and *avere/essere* selection, impersonal passivization, and existential/presentational constructions) have long been known not to converge even within a language, let alone across languages (Rosen 1984, Zaenen 1993, Levin and Hovav 2005, Ch. 6). The syntactic diagnostics do not converge cleanly on either a uniform unaccusative class, or a uniform unergative class. The basic formal distinction between unaccusative and unergative verbs according to whether the subject is an internal argument or an external argument is also contested. The recent syntactic literature reveals multiple types of of unaccusative verbs according to where their subjects are introduced (Kural 2002; Alexiadou 2014; Copley and Harley 2015). Verbs can appear in more than one syntactic configuration and thereby be both unergative and unaccusative – for example, *waltz* functions as an existential unaccusative verb when its subject is a small clause (PredP) complement, and as an unergative verb when its subject is a specifier of VoiceP (Irwin 2018). A case has also been made for "hybrid verbs" whose subjects are simultaneously affiliated with the two functional projections vP and VoiceP (Pineda and Berro 2020; Tollan and Massam 2022; Ausensi and Pineda 2025). Finding unaccusativity vs. unergativity robustly manifested in Nez Perce verb morphology would therefore offer welcome help in sorting out these issues concerning verb classification, as well as much needed empirical evidence for morphological theories that allow allomorphy selection by morphosyntax, such as DM, and against more modular morphological theories such as Minimalist Morphology.

(4) contains a sample of intransitive C-class verbs which are consistent with Cash Cash's view in that they denote so-called internally caused eventualities, and in that their translational counterparts in other languages have the typical characteristics of unergative verbs. I cite them from Aoki's (1994) dictionary, in the Incompletive Present ("Imperfect") form where available, since its ending *-ce* serves as a convenient C-class diagnostic.

(4) *Unergative C-class verbs*

a. Agentive intransitives: *cewcewí-ce* 'I am whispering', 'I am telephoning', *číiq-ce* 'I talk', *yéeḱem-ce* 'I walk up (to it) softly', *x̂eléeley-ce* 'I am busy', 'I am working', *teméeye-ce* 'I am taking a mud bath', *púq-ce* 'I go separate ways', *liklíi-ce* 'I am going around', *wix̂wikí-ca* 'I argue', *timmíyu-ce* 'I am making a plan', 'I deliberate', *talapóosa-ca* 'I worship', *ḱíixyá-ca* 'I am limping', *wéesu'-ce* 'I am squatting', *háawt-ca* 'I keep clean' (intrans.), 'I observe the Sabbath'

b. Experiencer intransitives: *x̂ipípip-ce* 'I am shaking', *wiẏuwiẏú-ce* 'I am perplexed',

*'éetx̂ew-ce* 'I am sad', *'éeỳs-ce* 'I am happy', *lilóoy-ca* 'I am happy', 'I am thankful', *cíiẁat-ca* 'I disagree', 'I am hurt over something', *wiwlakí-ca* 'I am hurt (in my feelings), *cúukwe-ce* 'I know', *qisítisq-ce* 'I am fretting', *sisúy-ce* 'I fear', *quyíyim-ce* 'I am in a hurry', *ke'éw-ce* 'I am confident (of mine)', *suù̀li-ce* 'I am starved', *'éewíi-ce* 'I am sleepy', *kicéey-ce* 'I am shy', 'I am ashamed', *heyéeq-ce* 'I am hungry', *luk-ce* 'I have palpitations', *lik̀úup-ce* '(my heart) is beating', *k̀omómay-ca* 'I am sickly', *k̀óomay-ca* 'I am sick', *qi'yáaw-ca* 'I am thirsty', *lu'uqí-ce* 'I am getting warm'

c. Source (emission) intransitives: *hi-'léese-ce* 'he makes noise', 'it is thundering', *hi-'la-páy-k-sa* 'it glows', *'ápas-ca* 'I am sneezing', *'óx̂o'óx̂a-ca* 'I cough', *muxlíi-ce* 'I perspire', *c̀áy-ca* 'I am defecating', *'íiw-ce* 'I urinate', *tíiwe-ce* 'I smell', *táwx̂an-ca* 'I snore', *'ilpsúus-ce* 'my nose is bleeding', *wiyúuù̀tax̂-ca-ma* 'I wept'

d. Entity-specific change of state intransitives: *qaà̀táaw-ca* 'it is drying', *hi-p̀úuù̀lem-ce* 'it is rising, bulging, swelling' *'e-púuxstey-ne* 'his swelled up', *hi-káa'áw-ca* 'it is dawning', *k̀úup-ce* '(my stick-like object) breaks'

S-class verb roots, on the other hand, according to Cash, typically describe EXTERNALLY CAUSED eventualities. They include both transitive verbs such as *kíwyek* 'feed', *kíwyek-se* 'I am feeding (mine)', which describes an eventuality caused by an external Agent (the feeder) that acts upon a "Theme" (the thing fed), and unaccusative intransitive verbs of the anticausative type, which can be assumed to have a suppressed external cause argument at some level (Levin and Hovav 2005, Reinhart 2016; Everaert et al. 2012).[5] Cash illustrates this type of intransitive with the bound S-class verb stem /-láhsa-/ '(to go) up', as in the compound *'ipa-láhsa-sa* '(the smoke) is rising', where /'ipée/ 'fog, smoke' indicates the Theme of the rising process. Besides anticausatives, the unaccusative class is also considered to include directed motion verbs like *arrive, leave*, spatial verbs like *sit, stand, lean*, and also existential/presentational verbs like *exist, appear, happen, occur*, for which internal/external causation is undefined or irrelevant, but which are core unaccusatives by the morphosyntactic criteria (Levin and Hovav 2005: 126). Nez Perce's S-class indeed contains many anticausative, directed motion, and existential/presentational verbs:[6]

(5) *Unaccusative S-class verbs*

a. Anticausative: *hi-l̀eyú'k-se* 'it melts', *hi-sic̀é-se* 'it is congealing', *hi-tóqla-sa-m* 'it exploded', *hi-laà̀qíi-sa* 'it ripens', *wilíik-se* 'I am falling', *hi-tqúu-se* 'he is drowning', *hi-sisp̀íiti-se* 'it is bent', *niktíik-se* 'I become thin, I become poor', *liqúuqelik-se* 'I am dying with cold', *'iléeyq-se* 'I am getting hot'

b. Directed motion: *pin̂íi-se* 'I am coming out [of the forest, bushes. . . ]', *teqíik-se* 'I am descending', *kúu-se* 'I am going'

c. Existential/presentational/spatial: *wée-s* 'I am' (with an irregular allomorph of *-se*), *wic̀ée-se* 'I become, I am born, I stay (present)', *hi-lamlíi-sa* '(the snow) is going [away]', *hi-k̀úuxs-ce* 'there is a mound'

Cash presents the distribution in (4)-(5) as a tendency rather than as a categorical generalization. And a perusal of Aoki 1994 does net many contrary cases. The C-class contains not only unergative verbs like (4), but quite a few anticausatives and verbs of directed motion, location, existence, appearance, and of change of location, existence, and appearance, whose counterparts are classed as unaccusatives in other languages:

[5]Other writers treat anticausative verbs as inherently monadic predicates with an internal "Theme" argument, to some of which an external cause argument can be added to yield a transitive counterpart (Alexiadou et al. 2006, 2015; Harley 2008).

[6]Also spatial verbs, though these are mostly compounded with other verbs in Nez Perce; examples will be cited below.

(6) *Unaccusative C-class verbs*

a. Anticausative: *hi-wce'é-cix* 'it (meat) is drying', *líw-ce* 'I am burning', *hi-sáatk-ca* 'it becomes thick', *qimímii-ce* 'I get numb', *huhúup-ce* '(evergreen needles) are falling', *tiṅkí-ce* 'I am dying', *hi-c̀áax̂-ca* 'it is splitting', *hi-ḱíw-ca* 'it is splitting apart', *hi-lá'am-ca* 'it is decreasing', *hi-pa-wáax̂-na* 'they woke up'

b. Directed motion *páay-ca* 'I am coming', *wúuy-ce* 'I run away', *hi-liwtáy-ca* 'it is leaving the nest', *hi-cilíilp-ce* 'it is rotating, he is turning around', *húux̂ele-ce* 'I am rolling down (out of bed, down a hill. . . )', *wihne-ce* 'I am going away' *tíi-ce* 'I am slipping on ice', *x̂uyisí-ce* 'I slipped'

c. Existential/presentational/spatial: *téẇye-ce* 'I live (at such-and-such a place)', *ɬkalál-ca* 'I am stuck', *hi-ɬpeqi-ce* 'it is stuck', *talqí-ca* 'I stop', *hi-ɬéyíi-se* 'it (e.g. brush) is spread', *hi-sáw-ca* 'he is missing', *wiiclem-ce* 'I fail' *c̀á'-ca* 'it fits, it is the right time', *wix̂su-'ú-ce* 'I am sitting', *hi-wɬéé-ce* 'they are gathered', *ha-'amkí-ca* 'they are gathered'

Conversely the S-class also contains not only unaccusative verbs, but many unergative-type verbs as well, with agent, experiencer, source, and entity-specific undergoer subjects:

(7) *Unergative S-class verbs*

a. Agentive, manner of motion: *híiteṁyek-se* 'I am taking a sweat bath', *weecée-se* 'I dance', *wéece-se* 'I ride (a horse)', *wéec̀e-se* 'I get on (a horse), I am going aboard (a canoe)' *tíỳe-se* 'I am laughing', *piním-se* 'I am sleeping', *lew-lúu-se* '(fish) is hibernating', *kúu-se* 'I am doing', *séepeeẇi-se* 'I am groping around', *'áalwi-sa* 'I am limping', *keṅwíi-se* 'I am knitting', *cílcil-se* 'I am trotting', *'iméec̀inp-se* 'I prophesy', *'imeléeyek-se* 'I go prowling', *láw-tim-sa* 'I am just talking', *'e-wníini-se* 'I am paying for the bride', *nekí-se* 'I am thinking', 'I am planning', *wóoli-sa* 'I shape an arrowhead',

b. Experiencer: *hawáq-sa* 'I miss, I lose (mine)', *he-'éyewi-se* 'he is peaceful', 'he is calm', *hi-'láatwi-sa* 'he is tired', *luqúuke-lik-se* 'I am freezing'

c. Emission: *tíi-se* 'I am breaking wind', *wéeẇuuq-se* 'I vomit', *tul-c̀ée-se* 'I am spitting at (a target)', *'iwil-á-k-sa* 'I am urinating in exactly the same place' *sukí-se* 'I know, I recognize'

d. Entity-specific change of state: *'ipnée-tiic̀e-se* 'it corrodes', *hi-latíi-sa* 'it is blooming', *'ila-táx̂aq-sa* 'it is changing color' (said e.g. of leaves), *'alálp-sa* 'I blush', *niktík-se* 'I become thin', 'I become poor'

## 2.3 Deal & Wolf 2016

Deal and Wolf 2016 come to the opposite conclusion, that C-class intransitives are unaccusative. They attribute this view to Cash Cash 2004, who, as just summarized, actually claims that C-class intransitives tend to be verbs of internal causation, which as per Levin and Hovav 2005 are unergative, and that on the contrary it is *S-class* intransitives that are unaccusative. For D&W unaccusatives are verbs whose sole argument bears a Theme role (though for Levin and Hovav 2005 they also have an additional hidden Cause role). The data in (6) and (7) conform to D&W's generalization and contradict Cash's generalization, while the data in (4) and (5) conform to Cash's generalization and contradict D&W's.

Evidence against *both* Cash's generalization *and* D&W's generalization, and broadly against any notion that the S-class/C-class stem divide is predictable from argument structure, comes from homonyms, plesionyms, and antonyms that have the same argument structure and differ only in that

one is an S-class stem and the other is a C-class stem. A sampling of such intransitive minimal and near-minimal semantic pairs is given in (8).

(8)

| S-class intransitive verbs | C-class intransitive verbs |
|---|---|
| *'iléeyq-se* 'I am getting hot' | *lu'uqí-ce* 'I am getting warm' |
| *'áalwi-sa* 'I am limping' | *ɬ́íixya'-ca* 'I am limping' |
| *hi-tqúu-se* 'he is drowning' | *hi-ktátam-ca* 'he is choking' |
| *cinúuk-se* 'I have gonorrhea' | *nistekí-ce* 'I have sinus trouble' |
| *teqe-cíckup-se* 'I am alarmed' | *cicwáay-ca* 'I am surprised' |
| *'alálp-sa* 'I blush' | *cikilwíit-ce* 'I feel dizzy' |
| *'aayáwi-sa* 'I am well off, prosperous' | *yaq-ca* 'I am well off, comfortable' |
| *hi-laɬqíi-sa* 'it is ripening' | *hi-p'ím-ce* 'he is growing' |
| *wilíik-se* 'I am falling' | *wiwí-ce* 'I am (if a tree) falling' |
| *máaci-sa* '(mine) is rotten' | *máalx-ca* '(my meat) is spoiled' |
| *tíỷe-se* 'I am laughing' | *ɬ́éece'-ce* 'I am giggling' |
| *weecée-se* 'I dance' | *weeɬ́éy-ce* 'I am jumping' |
| *teɬ́wée-se* 'I am talking to (mine)' | *ɬ́íik-ce* 'I talk' |
| *wewíiti-se* 'I go downstream' | *toláy-ca* 'I go upstream' |
| *teqíik-se* 'I am coming down' | *ɬquyím-ce* 'I go up' |
| *hi-tyamíiwi-sa* 'it is summer' | *h-léeẃ-ce* 'it is winter' |
| *wiwaʔxwíi-sa* 'I am idle' | *hiẃ-ca* 'I am lazy' |
| *iséepi-se* 'I'm carrying (mine) on my back' | *'inéhne-ce* 'I am carrying (mine)' |
| *wićúu-se* 'I am staying with (mine)' | *téeme-ce* 'I'm staying with my wife's people' |
| *'úuyi-se* 'I begin' | *talqí-ca* 'I stop' |
| *siméy-se* 'I miss (an opportunity), I fail' | *wiiclem-ce* 'I fail' |
| *tukéey-se* '(mine) is lying down' | *'í-ce* 'I'm lying down' |
| *ɬ́ackɬ́ací-sa* 'I am shivering' | *x̂ipípip-ce* 'I'm shaking / shivering / trembling' |

To these intransitives we can add similar transitive pairs:

(9)

| S-Class transitive verbs | C-Class transitive verbs |
|---|---|
| *we-qíwtk-se* 'I am cutting grass' | *tu'pí-ce* 'I cut grass' |
| *héetewi-se* 'I value (mine)' | *sayqí-ca* 'I value (mine)' |
| *'ipɬ́ée-se* 'I hit (mine)' | *wáwya-ca* 'I hit (mine)' |
| *'e'wíi-se* 'I shoot it (with an arrow)' | *wááp-ciỷaw-ca* 'I kill' |
| *kíwyek-se* 'I am feeding (mine)' | *ka'áy-ca* 'I am preparing food (for mine)' |
| *siyekí-se* 'I am scouting'; 'I go to see' | *siléew-qitwe-ce* 'I'm watching'; 'I surveil'; 'I scrutinize' |
| *miɬ́íi-sa* 'I hear (mine)' | *hekí-ce* 'I see (mine) |
| *hiwikí-se* 'I am cutting meat into thin pieces' | *'isíwe-ce* 'I'm skinning' |
| *tiẃalpí-sa* 'I am scraping hair from hide' | *tíipsaʔ-ca* 'I scrape dry hide' |
| *capáa-kayk-sa* 'I wash'; 'I clean' | *capáa-maq-ca* 'I purify' |
| *tuɬqíik-se* 'I fasten around my ankle' | *ɬakɬ́óo-ca* 'I fasten around my neck' |
| *hawáq-ss* 'I miss (mine)' | *tilláap-ca* 'I miss her' |
| *yeqeht-se* 'I am spilling it out' | *ɬ́ewqíi-ce* 'I throw it out' |
| *nikéecɬ́uxsk-se* 'I pull out' | *ɬux-ce*'I am pulling out' |
| *téeʔneh-weyik-se* 'I persuade' | *téeʔnehme-ce*'I persuade' |

One might try to set aside this evidence on the grounds that internal/external causation and unaccusativity/unergativity depend on subtle components of meaning that even a dictionary as good as Aoki's fails

to record. A well-known cautionary example is that *shaking* is an externally caused eventuality while *shuddering* is an internally caused eventuality (Levin and Hovav 2005: 100). For what it is worth, the last pair of examples cited in (8) are both glossed as 'shiver' in AD. But in the end the cumulative weight of the data in (4)-(9) establishes beyond any doubt that both prototypical internally caused / unergative verbs and prototypical externally caused / unaccusative verbs can belong either to the S-class or to the C-class, so that the two verb classes are independent of lexical meaning and argument structure.

D&W support their contrary claim with a formal argument for a syntactic version of the correlation between stem class and argument structure. On the assumption that passive participles must be predicated of Theme arguments, and intransitive verbs have Theme arguments only if they are unaccusative, the hypothesis that unaccusatives belong to the C-class predicts that S-class intransitives should not have passive participles. If this prediction were correct, they would indeed have a strong argument for their claim. But the prediction is actually incorrect. Passive participles do get formed from S-class intransitive verbs such as those in (10). That these participles are built from S-class stems is shown by their ending *-iṅ* – participles of C-class verbs end in *-niṅ*. It is also shown by the ending *-se/-sa* (rather than *-ce/-ca*) of the corresponding present imperfective forms.[7]

(10) Passive participles from S-class intransitives

a. *híiteṁyek-iṅ* 'sweat bathed, competent, well prepared', *híiteṁyek-se* 'I am taking a sweat bath'

b. *máac-iṅ* 'spoiled, rotten, fetid, putrid, sour', *máaci-sa* '(mine) is spoiled'

c. *qeqéew-iṅ* 'drunk, intoxicated, delirious', *qeqéewi-se* 'I am drunk'

d. *niktíik-iṅ* 'thin, poor', *niktíik-se* 'I become thin, I become poor'

e. *ceptuxt-íxnik-iṅ* 'a crawling one'; *'ipsqi-líxnik-iṅ* 'a walking one' (*'ipsqí* 'on foot'), *ceptuxt-íxnik-se* 'I (e.g. a baby) am crawling around' (*ceptuxte* 'on all fours', *lixnik* 'to (move) around')

f. *'áalw-iṅ* 'person with an injured leg', *'áalwi-sa* 'I am limping'

g. *'ináa-tamaaw-iṅ* [sic] 'determined', *'ináa-tamaalwi-sa* 'I plan, I decide' (*'ináa-* 'reflexive')

h. *tamṫakíi-ṅ* 'colored (from contamination)', 'smeared', *tamṫakíi-sa* 'it (mine) (color) rubs off'

i. *héec-iṅ* '(a person who) is made to resemble someone, resemblant', *héece-se* 'I look like (mine)'

j. *tipíipi-ṅ* 'foamed', *hi-tpíipi-se* 'it becomes sudsy'

k. *'éeti-ṅ* 'cooked', 'ripe' , *he-'éti-se* 'it will be cooked'

More evidence that the S-class/C-class distinction is unrelated to argument structure is that it also applies to verbal and adverbial suffixes, to adverbial bound stems that indicate manner and location, and to tense suffixes. These items probably have no argument structure of their own, but if they had any, it would surely be the same for them all, and it would hardly involve internal causation or unaccusativity. The fact that the S-class/C-class distinction extends to them tells against the hypothesis that ties that distinction to argument structure. Here too we find S-class and C-class items with similar meanings. Among bound stems, S-class /-(l)áhsa-/ 'up' stands against C-class /-(l)éhneN-/ 'down', and C-class /toláyN-/ 'upstream' stands against S-class /wik-/ 'downstream':

[7]Unsurprisingly, passive participles can be formed from transitive verbs of both classes.

(11) a. *tama- nka'- cap- áhsa- sa*
/temée- nikée- 'iseepí- láhsa- seeN/
place- pull- carry- up- IncPres
'I raise you up with a rope'

b. *teme- nke- 'cep- éhne- ce*
/temée- nikée- 'iseepí- lehneN- seeN/
place- pull- carry- down- IncPres
'I let you down with a rope'

c. *'iyée- wik- se*
/'iyee- wik- seeN/
in water- downstream- IncPres
'I am floating downstream'

d. *toláy- ca*
/toláyN- seeN/
go.upstream- IncPres
'I go upstream'

There is not likely to be any argument-structural distinction between 'up' and 'down' that could be responsible for the morphophonological difference between the pairs of stems denoting them, especially since it is reversed in the pairs (11a,b) and (11c,d).

In sum, the data in (4)-(24) contradict even the weakest form of the claim that the distinction between C-class and S-class morphemes is related to argument structure. The C-class stems and S-class division is orthogonal to that between internal and external causation, and between unergatives and unaccusatives, no matter whether identified by semantic/thematic criteria, or by formal morphosyntactic criteria such as the distributiuon of passive participles. And it applies not only to verb stems, but also to derivational and inflectional affixes, which have no such argument structure. There appears to be no morphosyntactic feature that could trigger a context-sensitive "readjustment" or allomorphy rule.

# 3 The phonological nature of the C-class stem effect

Now for my positive proposal. The difference between C-class stems and S-class stems is *phonological*, and autosegmental phonology provides the key to understanding it. The mutations triggered by C-class stems are phonological realizations of a floating stem-final /-n/, a nasal with no consonantal slot of its own, notated here informally as /-N/. /-N/'s realization is phonologically predictable from the segmental makeup of the following suffix. I first present the environments of suffixes beginning with vowels and non-coronal consonants in 3.1, then the harder and more interesting cases of suffixes beginning with coronal consonant in 3.2, and finally in 4.2 the surprising solution to the mystery of single-consonant suffixes. Each class of cases yields a different set of arguments in favor of the phonological analysis.

## 3.1 Before vowels and noncoronal consonants

The simplest reflex of stem-final *-N* is seen before vocalic suffixes. The nasal is syllabified with the following vowel, satisfying Nez Perce's obligatory onset requirement.

(12) a. S-class stem: /hipi-uu'/ *hipú'* 'I will eat'
b. C-class stem: /hekiN-uu'/ *hexnú'* 'I will see'

The situation with velar, postvelar, and labial suffixes in (2) is only slightly more complicated. It is illustrated in (13) with the frequentative remote past suffix /-qaana/, the frequentative recent past /-qaaqa/, the separative *-kike* 'away', the adverbial *-qawN* 'straight through', and the cislocative suffix *-m-*.

(13) a. Vocalic C-class stem: /'imíN-qaana/ *'imínqana* 'I used to go to dig', /'e-wiyée-híN-kike/ *'ewyéekike* 'she said it as she traveled (away from here), /'ipsqí-léeN-qaaqa/ *'ipsqiláanqaaqa* 'I walked around'

b. Consonantal C-class stem: /hii-ḳuyímN-qaana/ *hiḳoyímnaqana* 'he used to go up', /hii-káa'awN-qawN-e/ *hikáa'awnaqawna* 'he stayed until morning', /la'amN-qawN-ca/ *la'ámnaqawca* 'he cut it right through', /cikáawN-qaaqa/ *cikáawnaqaqa* 'I typically got afraid',[8] /'e-tiwíkN-kik-e/ *'etwíxnikike* 'I continued to follow it', /hii-pe-péeyN-kike/ *hipapáaynikika* 'they came to a place away from here', /hii-ḳuyímN-me/ *hiḳuyímnime* 'come in!', /hii-teqíik-qawN-see/ *hitqíixqawca* 'comes straight down', /páa-teqeekN-qawN-siik/ *páatqaaxnaqawcix* 'they briefly see her as they go right through' (AT62, see also AG94, AD573, C173).

c. Vocalic S-class stem: /péeqwii-qaana/ *páax̂wiqana* 'I used to steal', /hii-kuu-kike/ *hikúukike* 'he left (from somewhere else)', /hii-pe-wewíiti-m-e/ *hipewewíitime* 'they came downstream'

d. Consonantal S-class stem: /hii-cikilíi-tuq-kike/ *hickilíitox̂kika* 'he went on back', /'aḷwí-nik-qaqa/ *'aḷwínixqaqa* 'I used to spend winter (there)', /'ice-sú'up-qawN-e/ *'icasóṗqawna* 'I cut it right through'

The epenthesis in (13b) provides another argument that the floating nasal is part of the stem and not part of a suffix allomorph. (13b) shows that a vowel is epenthesized to break up three-consonant clusters as well as word-final two-consonant clusters ending in sonorants. The epenthetic vowel is *a* before postvelars and *i* elsewhere (AG119 ff.); *-n* from /-N/ also assimilates to a following back consonant by allophonic retraction to [ŋ]. For purposes of epenthesis, /-N/ behaves like any other final consonant.

(14) a. Cislocative Imperative Singular /-m-k/

i. Vocalic S-class stem: /kúu-m-k/ *kúum* 'come!'

ii. Consonantal S-class stem: /'aac-m-k/ *'áacim* 'come in!'

iii. C-class stem: /sepeel-kilíiN-m/ *sepéelkiliinim* 'pass it over here!'

b. Cislocative Imperative Plural /-m-t-k/

i. Vocalic S-class stem: /kúu-m-t-k/ *kúumtx* 'come!' (pl.)

ii. Consonantal S-class stem: /wéeyik-m-t-k/ *wéeyikimtx* 'cross over this way!' (pl.)

iii. C-class stem: /sepeel-kilíiN-m-t-k/ *sepeelkilíinimtx* 'pass it over here!' (pl.)

*i*-epenthesis is treated as suffix allomorphy by Aoki 1970, 1994 and by Crook 1999. They list the allomorphs for each suffix separately and give the most general possible formula for their distribution (see AG124 for Habitual Remote /-qaana/, AG125 for Cislocative Imperative Singular /-m/ and Cislocative Imperative Plural /-m-tk/, and C97 for Habitual Past /-qaaqa/). Their formulas can however be subsumed under our simple phonological generalization.[9]

The epenthetic vowel is inserted at a morpheme boundary if possible, as in (14aii) /ʔáac-m/ *ʔáacim*, (13a) /hiḳuy-ímN-qana-/ *hiḳoyímnaqana-*, not **-hiḳoyimanqana*. This is an instance of Morpheme Integrity (Kenstowicz 1994), more specifically of O-Contiguity (McCarthy and Prince 1995), which prohibits epenthesis inside morphemes. I rephrase and generalize it here to prohibit epenthesis inside constituents, not only morphemes but stems and words, yielding a preference for edge epenthesis over internal epenthesis at all levels.

(15) O-Contiguity: The output correspondents of segments that are contiguous in an input constituent are contiguous.

[8] Crook records a variant with epenthetic *i* in *cikáawniqaqa* 'I always got afraid' (C102, C97).

[9] See further AD:374, who cites slightly different forms.

This analysis has the following consequence. The ergative ending is *-nm* after a vowel, and after most consonant-final nouns it is *-nim*:

(16) a. / /heesuu-nm/ *heesúu-nm*. 'lamprey' (AO120)
b. /sikeem-nm/ *sik̓éem-nim* 'horse' (AO639)

If the ergative morpheme is /-nim/, the output forms are correctly derived. The *-i-* of /-nim/ is deleted after a vowel as in (16a), but cannot be deleted after a consonant as in (16b) because that would produce a prohibited cluster **-mnm*. If the ergative morpheme were /-nm/, we would expect /sikeem-nm/ → **sik̓éeminm* by intermorphemic epenthesis.

## 3.2 Before coronal consonants

We have seen that a final *-N* in C-class stems surfaces as *-n* wherever it is phonologically realizable as an independent nasal consonant, namely before vowels and non-coronal consonants. The fate of *-N* before a coronal consonant depends on the coronal's manner of articulation.[10] Before suffixes with initial *t-*, *-N* is simply deleted, which neutralizes the distinction between C-class stems and S-class stems:[11]

(17)

| | S-Class | C-Class |
|---|---|---|
| Habitual (Frequentative) Present | *-teetu(m)* | *-teetu(m)* |
| Plural Habitual Present | *-teṅiix* | *-teṅiix* |
| 'going to' | *-tee* | *-tee* |
| 'back, reversative' | *-tooq* | *-tooq* |
| 'half-heartedly' | *-táy* | *-táy* |
| 'be about to, intend' | *-teṫée* | *-teṫée* |
| 'excessively' | *-tamáw* | *-tamáw* |

For example, the C-class vs. S-class distinction between the verbs *hekiN* and *hipi*, manifested before vowels as in(12) and before *-s* in (18a,b), is neutralized before /-teetu/ in (18c,d):

(18) a. *'èekíce*
/'e-hekiN-see/
3OBJ-see-INC
'I see it'

b. *'èepíse*
/'e-hipi-see/
3OBJ-eat-INC
'I eat it'

c. *'èektéetu*
/'e-hekiN-teetu/
3OBJ-see-HAB
'I always look at it'

d. *'èeptéetu*
/'e-hipi-teetu/
3OBJ-eat-HAB
'I always eat'

Suffix-initial glottal /ṫ/ works like plain /t/, except that it leaves behind glottalization on the /-n/ when it deletes.

The deletion of *-N* before *t* (or rather, its failure to dock there) is due to Nez Perce's phonotactic prohibition on *-nt-* sequences within phonological words, which holds at stem-suffix boundaries, and

[10] As far as I can tell, there are no verb suffixes that begin with underlying /l/, /ɬ/, /l̓/, /ɬ̓/, or /h/.

[11] *Pace* C143-4, the neutralization of C-class stems and S-class stems is not limited to the habitual present, but happens regularly before all stems and stem suffixes that begin with *-t*. See the examples in C97, C121, C137, C173, C174, AG95, AD697, AD703, AD782, AG681.

apparently also morpheme-internally.[12]

*-N* is suppressed also before /s/, but there it fuses with *-s* into *-c*, so that the distinction between C-class stems and S-class stems is maintained, as was illustrated in (3). Nez Perce has no instances of *ns* across a stem+suffix boundary.[13]

For several reasons, the combination of stem-final *-N* with suffix-initial *s-* to *c* is best seen as a fusion of their mutually compatible features, not as a set of conditioned changes. Phonetically and phonologically, the affricate *c* in (3) is a natural realization of *s* after *n*. As a sound change it no doubt originates in a mistimed velar closure, in the way the intrusive [t] in English words like *dance* does. As a phonologized synchronic process, it merges the [–continuant] feature of stem-final *-n* with the [+strident] feature of suffix-initial *s-*, retaining the coronal place articulation that *n* and *s* share, and leaving the incompatible features unrealized. The fusion analysis also has the formal advantage of relieving the phonology of an *s* → *c* change opaquely conditioned by a deleted nasal.

Most interestingly, the fusion analysis correctly predicts a difference between the result of merging floating *-N* and anchored *-n*. Floating *-N* merges with *s* into the monosegmental affricate *c*, as in (3), whereas anchored *-n* combines with *s* into the cluster *nc*, as in (22).

(19) a. i. /páayN-se/ *páayca* 'I am coming' (**páaynca*)
ii. /'e-hekíN-se/ *'èekíce* 'I see it' (**'èekínce*)
b. i. /qa'án-se/ → *qa'ánca* 'I respect (mine)'
ii. /'e-qa'án-siix/ → *'aqa'áncix* 'we respect (it)'

The merged affricate [c] that results from fusing /-N/ and /s-/ behaves as a single phoneme in Nez Perce syllable structure. Formally, the high ranking of the faithfulness constraint DEP-C forces /-N/ to be fused rather than getting a new C slot. Overt anchored *-n* however maintains its own inherent C slot, and then the prohibition of *ns* clusters is instead respected by linking it to *s* to form the cluster *nc*, see (20c). No analogous fusion of /-N/ with /t-/, which would combine features of both, is possible, for prenasalized or nasalized /t/, as well as /d/, are all prohibited in Nez Perce. Given that a new C-slot cannot be inserted for /-N/, the only way to salvage the structure is to delete the nasal entirely, see (20d).

(20) *Fusion, deletion, and assimilation*

a. N s → n s = [c]
C C

b. N n → n n = [n]
C C

c. n s → n s = [nc]
C C C C

d. N t → t
C C

Unsurprisingly, overt *n* in *-ns* clusters is retained as anchored /n/ in loanwords as well: the assimilated Nez Perce rendering of English *beans* is *pínc*, not **píc* (AD540, 542).[14]

[12]But *-nt-* does occur across nominal compound boundaries: *sáaqan-toqoxˆ-níin* 'bald', from *sáaqan* 'crown (of the head)' + *toqoxˆ* 'peeled', cf. *toqoqí* 'to peel', 'to be bald' (word-final *-/q/ → xˆ* is regular), *saqan-táayxˆ* 'bald eagle', *'imn-tasxˆ* 'knee-fat', *wéewin-tim-se* 'moan' (*wéewin* 'with pain or sickness', *tim* 'talk'), *kun-temelúukt* 'second' (*kun* 'next', *temelúukt* 'the second one', 'next in line'), *kun-tiyamíiwit-pa* 'the summer before last' (*tiyamíiwit* 'summer', 'year', *-pe* 'locative'). I take this to mean that the deletion is restricted to the stem level. That does not invalidate the rule (contra 1999: 144). At an earlier stage of the language nasal deletion probably operated even across compound boundaries, witness the "archaic" (AD496) variant pronunciation *noo-ciwáatxˆ* of the compound /núun-ciwáatq/ *non-ciwáatxˆ* 'we alone'.

[13] Aoki's (1970: 23) inventories of medial and word-final consonant clusters do not include *ns*. Elsewhere *-ns-* is also very rare; the reduplicated word *qinsqíns* 'muscular' (AD586) seems to be the only morpheme-internal instance, and *qa'ansímay* 'ingrate', consisting of *qa'án* 'respect' (with anchored *-n*!) and *siméy* 'lack', 'fail' is a compound.

[14]As evidence against the phonological analysis, C (p. 143) states that he has found no cases of s → c / n___, overlooking

## 3.3 Floating and anchored nasals

No nominals have a floating /-N/, but many end in ordinary anchored /-n/.

(21) ʔ*ipáyn* (Acc. ʔ*ipáyn-na*) 'sun-dried loaved of cround camas', *píik̀un* (Acc. *pikúun-ne*) 'river', *pátan* (Acc. *patána, patáan-na*) 'bush', *láykin* 'near', 'borderline' *cik̀íwn* 'man's brother-in-law' [*cik̀íwn-ise* 'he is marrying his brother-in-law'] *qíiwn* 'old man' *sáq̀an* 'canyon' [*sáqani-sa* 'there is a canyon' so really /saqani/?] *téekin* 'meadow', 'swamp' (Acc. *téekin-ne*)

The opposite is true for verbs. Numerous verbs have a floating /-N/, but verbs anchored final /-n/ are rare; I have found three: /qa'án-/ respect', /x̂an-/ 'snore', and /c̀inín/ 'weigh'.

(22) a. /qa'án-see/ *qa'ánca* 'I respect (mine)'
b. /'e-qa'án-sii-k/ *'aqa'áncix* 'we respect (it)'
c. /hii-pe-nées-qa'an-e/ *hipanáasqa'anna* 'they respected us'
d. /'e-qa'án-uu'/ *'aqa'ánno'* 'I will be nice to him'
e. /táw-x̂an-see/ *táwx̂anca* 'I snore'
f. /hii-táw-x̂an-e/ *hitáwx̂anna* 'he was snoring (at night)'
g. /hi-tew-x̂an-ʔipec/ *hitawx̂an̓nípac* 'snorer'.
h. /c̀inín-see/ *c̀iníince* '(mine) is heavy'
i. /c̀inín-uu'/ *c̀inínnu'* 'it will be heavy'

With a C-slot of its own, /-n/ combines with /-s/ into the cluster /-nc-/, and geminates before a vocalic suffix.

## 3.4 Floating *-N* in suffixes

The incompletive present ending *-see* also shows a nasal when a further affix follows, such as the translocative suffix *-ki* (C108) in (3.4b) and (3.4d). This indicates underlying /-seeN/ (plural /-siiN-x/):

(23) a. *wìléekèy'kse*
/wilee-ke'ey-k-seeN/
run-move-SF-INC
'I am running'
b. *wìléekèy'ksènki*
/wilee-ke'ey-k-seeN-ki/
run-move-SF-INC-TRN
'I am running away'
c. *wìléekèy'ksìx*
/wilee-ke'ey-k-siiN-k/
run-move-SF-INC.PL
'We are running'
d. *wìléekèy'ksìnki*
/wilee-ke'ey-k-siiN-k-ki/
run-move-SF-INC.PL-TRN
'We are running away'

The nasal also shows up before the cislocative suffix *-m* (C107), see (24b):

(24)

cases like (22b), and the loanword *pínc* 'bean(s)'. As counterexamples, he cites the retention of *s* in two words. The first is *qà'àan-símay* 'respectless, ingrate'. But this is a compound consisting of two phonological words, for *siméy* is not a suffix but an independent word; the compound structure of *qà'àan-símay* is also consistent with its stress pattern (C380). The fusion process does not apply across a compound boundary. The second is *qìnsqíns* 'muscular', the case of monomorphemic *ns* mentioned in fn. 13. Alongside *pínc*, AD also records a less assimilated form *píins*, with a devoiced stop, but retention of the long vowel and *ns* cluster of English *beans*.

a. ’iyéekèy’ksìx
/’iyée-ke’ey-k-siiN-k/
float-move-SF-INC-PL
‘We are floating’

b. ’iyéekèy’ksìnm
/iyée-ke’ey-k-siiN-k-m/
float-move-SF-INC-PL-CIS
‘We come floating’

# 4 Fusion vs. deletion

Since geminates are only allowed intervocalically, the encounter of *-N* with the initial *n-* of the locative nominalizer /-nwees/ results again in a fused *n*, indistinguishable in the output from an original singleton; see (25) and cf. (20).

(25) a. after vowel-final S-class stems: /wicée-nwees/ → *wicéenwees* ‘residence’, from /wicée/ ‘live’

b. after vowel-final C-class stems: /weqíiN-nwees/ → *weqíinwees* ‘dump’, ‘hell’, from /weqíiN/ ‘discard’

As expected, combinations of overt, anchored *-n* with suffixal *-n* are likewise fused, as in (26):

(26) a. /-ne/ ‘Remote Past’: /hipi-siin-ne/ *hìpsíine* ‘we were seeing’, ‘we saw’, (*-siin-* ‘Incompletive Plural’, C114)

b. /-nim/ ‘Ergative/Possessive’: /qíiwn-nim/ *qíiwnim* ‘old man’s’ (AD487), /nuun-nim/ *núunim* ‘we-ERG (C128)

c. /-núut/ ‘Abessive’: /cíickan-núut/ *cickánot* ‘without a blanket’ (AD21), /ti-tóhon-núut/ *titohónot* ‘without pants’ (AD497)

Following Crook (C16, C114), I assume for Nez Perce a high-ranked constraint that prohibits geminates (Crosswhite 1998).

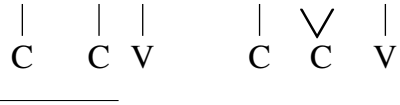
(27) *GEMINATE: Consonants are singletons.

*GEMINATE seems to be restricted to derived environments at the stem level, but takes effect regularly in that context.[15]

An independent argument for floating consonants comes from an epenthesis process. Even though consonant stems with and without floating *-N* before suffixal *-n* converge phonetically on a singleton [n], the fusion analysis predicts structurally distinct outputs for them.

(28) a. S-class stems: . . . s] [n e] = [sne]

b. C-class stems: . . . s N] [n e] → . . . s n] [ n e] = [sne]



[15]Exceptions seem to involve morpheme-internal geminate sonorants, e.g. *malláps* ‘flip’, *’illíp* ‘redly’, *ḱállay* ‘dog salmon’, *timmíyu* ‘to plan, to deliberate’; Crook estimates the total number of exceptions at less than ten. Intervocalic geminates also arise regularly across the boundary between nouns and case endings, as in Locative *miṫip-pe* ‘elderberry’ and Accusative *tohón-na* ‘pants’ (AD780), (AD452), *cehén-ne* ’dewlap’ (AD14), *téeqinne* ‘dry gully’ (AG 74), ’*sáq̓anna* ‘canyon’ (AD623), *saqáanna* ‘top of the head’ (AD623), but not in /qíiwn-ne/ *qíiwne* ‘old man’ (AG74). In addition, surface geminates are created by vowel syncope at the word level, as in /hii-wiwíN-se/ *hiwwíce* ‘(a tree) is falling’, /’a-titiwatíi-ú’/ *’à-ttiwati-yó’* ‘I am going to tell a story’ (AD763), /qilílu-ne/ *qillúu-ne* ‘rawhide-ACC’, and by expressive gemination, as in *x̂uyyís*, the emphatic form of *x̂uyís* ‘slipped’ (AD933).

Remarkably enough the representational difference between the phonetically identical (28a) and (28b) is phonologically detectable. The diagnostic is geminate integrity in vowel epenthesis, as can be seen when we put the location suffix /-nwees/ of (25) after consonant stems (AD498, C192). The site of the epenthetic vowel distinguishes consonant-final stems with and without *-N*.

(29) a. *-inwees* after consonant-final S-class stems: /'áat-nwees/ → *'áat**in**waas* 'toilet', 'outhouse', from /'áat-/ 'to go out'

b. *-niwees* after consonant-final C-class stems: /'éeẏsN-nwees/ → *'éeẏs**ni**wees* 'heaven', 'happy hunting ground', from /'éeẏsN/ *'éeẏs* 'to be happy'

In (29a)=(30a) the cluster is broken up by inserting an epenthetic *i*. The vowel is inserted at the morpheme boundary, by MORPHEME INTEGRITY as in (2). But in (29b)=(30b) epenthesis into the virtual geminate is ruled out by the higher-ranked GEMINATE INTEGRITY constraint (Hayes 1986; Schein and Steriade 1986), which forces a violation of (15) CONTIGUITY (or MORPHEME INTEGRITY).

(30) a. S-class stems: . . . t] [n w e. . . → . . . t] i [n w e. . .

C C C V C V C C V

b. C-class stems: . . . s n ] [ n w e . . . → . . . s n] [ n w e . . . → . . . s n] [ n i w e . . .

C C C V C C C V C C C C V

The constraint that is responsible for ruling out the prohibited homorganic nasal-coronal sequences is *NT:

(31) *NT: *n [+cor]

$C_1$ $C_2$

*NT is enforced in the stem-level phonology to prohibit sequences of consonants consisting of a coronal nasal followed by a coronal, such as **nt, *ns, *nc, *nn, *ṅt, *ṅs, *ṅc, *ṅn.*[16] The constraint does not target feature-sharing structures like (30), which are admissible, as predicted by the theory (Hayes 1986; Schein and Steriade 1986). In contrast, (31) is not applicable to the non-homorganic nasal-stop clusters *mt, ms* , which are freely admissible within and across morphemes:

(32) *tíms* 'chokecherry', *tems-cúukwe-ce* 'I am explaining', *téem-tekey* 'grass for baking camas', *púutim-t* 'ten', *piním-se* 'I am sleeping', *'ikúut-tim-se* 'I am telling the truth', *séelix-tim-t* 'the Flathead language'

The outcomes in (3), (22), and (29) thus testify *for* the phonological analysis of the C-class stem effect, rather than against it (*pace* C143).

## 4.1 Glottal shift

The "attributive" or "passive participial" suffix ('one that is -ed', AD 186, C189) is realized as *-iṅ* at the end of a word (recall the many examples in (10)). Elsewhere it is realized as *-i's* (I can only find examples before consonantal endings). These forms are from underlying /-iṅs/ by deletion of one of the consonants, in response to the constraint (31) *NT, which prohibits homorganic sequences of the form "nasal consonant + oral consonant".

(33) a. /cepée-piýuqte-iṅs-'eny/ *capáa-piyoxt̂i'sayn* 'pie-DAT'

[16]since all obstruents in Nez Perce are voiceless, for obstruents *NT partly overlaps with a constraint that forbids sequences of the form "nasal+voiceless consonant" (*NC̥, Pater 1999).

b. /cepée-piýuqte-iṅs-ne/ *cepée-piýuxt̂isn̓e* ‘pie-Abs’

c. /cepée-piýuqte-iṅs/ *cepée-piýuxt̂in̓* ‘pie-Nom’

The Instrumental suffix is *-l̓es* after vocalic S-class stems, *-e’s* after consonantal S-class stems and *-n̓es* with C-class stems (C193, AD87).

(34) a. *-l̓es* after vowel-final S-class stems: /cilúu-l̓es/ *cilúu-l̓es* ‘cooking basket’ (from /cilúu/ ‘boil’

b. *-e’s* after consonant-final S-class stems: /cepée-we-q̓apap-l̓es/ *capóoq̓apapa’s* ‘a trap’ (from /cepée-we-q̓apap/ ‘tighten with a stick’, AD 603); here /e/ is elided and the resulting /’ts/ fuses into *s̓*.

c. *-n̓es* after C-class stems

i. after vowel-final C-class stems: /tíiṁeN-l̓es/ *tíiṁen̓es* ‘a pen’ (from /tíiṁeN/ ‘to make marks’

ii. after consonant-final C-class stems: /wéep-ci’yáaw-l̓es/ *wáapci’yáawn̓as* ‘for killing’ (from /wéep-ci’yáaw/ ‘kill’)

## 4.2 Suffixes consisting of a single consonant

Suffixes consisting of a single consonant display puzzling alternations which we can now make sense of, and which reveal that the phonological processes take effect cyclically in the derivation.

The descriptive generalization is that monoconsonantal endings are replaced by *-n* after C-class stems:

(35)

| | Underlying | S-class | C-class | |
|---|---|---|---|---|
| Active Participle (Nominalization) | /-t/ | -t | -n-t → -n | (36) |
| Perfect | /-s/ | -s | -n-s → -n | (37) |
| Imperative | /-k/ | -y | -n-k → n | (38) |

The explanation is that the suffix consonant is deleted after the /-N/ of C-class stems and stem-final *-N* docks on the vacated slot.[17]

The nominalizing suffix (the “active participle”) is manifested as *-t* after S-class stems and as *-n* after C-class stems (C184). Its underlying form is /-t/, which is deleted after C-class stems to safisfy the phonotactic constraint (31). The C-slot that it leaves behind is filled by the stem-final floating nasal, which creates the illusion of a suffix allomorph *-n*. Examples are displayed in (36), with the incompletive present added as a diagnostic of S-class stems vs. C-class stems, cf. (3).

(36) Nominalizer /-t/

a. S-class stems with nominalizer /-t/

i. /hipi-t/ *hípt* ’eating, food’; cf. Incompletive Present *hipí-se* ‘I am eating’ (C184, C384, AD157)

ii. /ciluu-t/ *cilúut* ‘cooking’; cf. *cilúu-se* ‘I am cooking’ (AD35)

iii. /ke-’inipi-t/ *ke’nípt* ‘biting’; cf. /’e-ke-’inipi-see/ *’e-ke’npíse* ‘I bite it’ (AD1049)

iv. /kúu-t/ *kúut* (1) ‘going’, (2) ‘doing’; cf. *kúu-se* (1) ‘I am going’, (2) ‘I am doing’ (AD237 ff.)

v. /tamáalwi-t/ *tamáalwit* ‘law’, ‘government’; /tamáalwi-t-ki-ni-k/ *tamáalwitkiṅix* ‘lawfully’, cf. *tamáalwi-sa* ‘I am leading’ (AD679)

[17] On /-q/, /-tq/ see below. Exceptional is /timmíyuN-k/ *timmíyu* ‘figure it out’ (for expected **timmíyun*), cf. /timmíyuN-see/ *timmiyúce* ‘I am making a plan’.

vi. /neekí-t/ *néekt* ‘thinking’, cf. *nekíse* ‘I am thinking’ (AD473)

b. C-class stems with nominalizer /-t/

i. /ḵóomayN-t/ *ḵomáyn* ‘being sick’; cf. *ḵóomay-ca* ‘I am sick’ (AD286)

ii. /paayN-t/ *páayn* ‘arriving, to arrive’; cf. *páay-ca* ‘I am coming’ (AD749)

iii. /tiṅukiN-t/ *tiṅúkin* ‘death’; cf. *tiṅkí-ce* ‘I am dying’, *hi-tṅúxn-e* ‘he died’ (AD749)

iv. /teḷéepteyN-t/ *teḷéepteyn* ‘mocking’; cf. *teḷéeptey-ce* ‘I am mocking’ (AD710)

v. /’is-túup-tuupN-t/ *’istúuptupin* ‘haircut’ (‘knife-cutting’); cf. *’istúuptup-ce* ‘I am cutting (my) hair’, *hipe-’s-túuptupn-e* ‘they cut hair’ (AD800)

vi. /qepísiN-t/ *qepísin* ‘strength’, cf. /’inée-qepisiN-se/ *’inéeqpisce* ‘I am doing my best’, *qepís* ‘strong(ly)’ (AD 578)

The Perfect exhibits an analogous pattern (C97, C120, AD618). The underlying ending is *-s*. It surfaces as such after S-class stems. After C-class stems, it deletes and the stem-final /-N/ replaces it in the vacated C-slot.

(37) Perfect /-s/

a. S-class stems with /-s/

i. /kúu-s/ *kúus* ‘I just left’, cf. Incompletive *kúuse* ‘I am going [away]’ (AD243)

ii. /hipi-s/ *híps* ‘I just ate’, cf. Incompletive *hipíse* ‘I am eating’ (AD156)

b. C-class stems with /-s/

i. /paayN-s/ *páayn* ‘I just came’; underlying /-N/ is shown by Incompletive *páay-ca* ‘I am coming’ (AD513)

ii. /hii-tiṅukiN-s/ *hitṅúkin* ‘he just died’, cf. Incompletive *tiṅkí-ce* ‘I am dying’ (AD749)

The Imperative ending is /-k/ (AD188). It shows the same pattern as the Nominalizer /-t/ and Perfect /-s/, with the addded twist that /-k/ is weakened to *-y* in codas after vocalic S-class stems (to *-x* if they end in *-i*), and deleted after a consonant. These realizations are enforced by Nez Perce phonotactics: word-final back consonant become fricatives, and *-Cy*, *-iy* do not exist. After C-class stems, the ending is *-n* as before (C99, C120, AG117, AD188).

(38) Imperative /-k/

(39) S-class stems with /-k/

a. /kúu-k/ *kúy* ‘do!’ (AD239)

b. /hipi-k/ *hípx* ‘eat!’ (AD158)

c. /titwatíi-k/ *titwatíx*) ‘tell a story!’ (AD188, AD763)

d. /we-kayx-k/ *’óokayx* ‘rinse!’ (AD197)

e. /kúu-m-k/ *kúum* ‘come!’ (AD144)

f. /léeǫeyN-’-k/ *leǫéeẏ* ‘calm down!’, via /léeǫeyN-’/ *leǫéeẏ* ‘calmly’ (AD346)

g. /’e-hekíN-k/ *’ehékin* ‘look at it!’ (AD109)

h. /’e-wiqíiN-k/ *’ewqíin* ‘throw it away!’ (AD891)

i. /’aac-qawN-k/ *’áacqawn* ‘go right in!’

j. /waaqiN-k/ *waaqin* ‘wake up!’ (C103), Pl. /waaqiN-tk/ *waaqitx* ‘wake up!’ (AD827)

Illustrative derivations for /-k/ are given in (40).

(40) a. Vocalic S-class stems: (38a.*i*) /kúu-k/ *kúy*

. . . u ] k ] → . . . u ] k ]
| | | |
V C V C

b. Consonantal S-class stems: (38a.*v*) /kúu-m-k/ *kúum*

. . . m ] k ] → . . . m ] k ]
| | | ⫩
C C C C

c. C-class stems: (38b) /'e-hekíN-k/ *'ehékin*

. . . n ] k ] → . . . n ] k ]
| ⫩
C C

Again, a set of apparently arbitrary allomorphic alternations reduces to a phonological process grounded in the language's phonotactics.

The suffixes /-tq/ 'Imperative Plural' and /-q/ 'Habitual Perfect' do not show this surface neutralization pattern, because their outputs *-ntx, -nx̂* are licit final clusters.[18]

(41) /'inii-m-tq/ *'inílimtx* 'give me (something)' (AD:1036), /hi-'ipsqi-láa'N-q/ *hi'psqiláa'nx* 'he was walking around' (AW193)

See (42):

(42)

| | S-class | C-class | |
|---|---|---|---|
| Imperative Pl. | -tx | -n-tx | C103 |
| Habitual Perfect | -x̂ | -n-x̂ | C121 |

# 5 Evidence for cyclicity

## 5.1 Argument 1: Final cluster simplification

Nominalizations in *-t* such as the ones in (36) can be further suffixed with /-'ipec/ to express a desire or tendency (AD1057),

(43) a. /hipi-t/ *hipt* 'eating' (36a.i) *hípṫípec* 'anxious to eat'
b. /ku̇́omayN-t/ ku̇máyN (36b.i) *ku̇omaẏnípac* 'tending to be sick'

and with /-'eesk/ into adverbs denoting prior time (AD991, C196):

(44) a. *hipṫéesx* 'before eating'
b. /páayN-t/ *páayn* 'arriving' (36b.ii) /páayn-'eesk/ *paẏnáasx* 'before coming'
c. /tiṅukíN-t/ *tiṅukín* 'death' (36b.iii) /tiṅukín-'eesk/ *tiṅxṅéesx* 'before death'

The suffixes are added to the reduced final *-n* form of C-class stems, suggesting that the final clusters are simplified prior to the next layer of morphology, by enforcing the constraints cyclically in the morphological derivation. To illustrate, from *yiyéewN-* 'to take pity on' (cf. *yiyéew-ce*) we derive:

(45) /yiyéewN/
Cycle 1: /yiyéewN-t/ *yiyéewn* 'mercy'
Cycle 2: /yiyéewn-'ipec/ *yiyeẇnípec* 'merciful'

[18]These clusters do not appear in Aoki's list (Aoki 1970: 23). According to Crook 1999: 27, the only true complex codas of Nez Perce are *-x̂s* and *-x̂c*. All other final clusters, he claims, have a syllabic consonant as nucleus.

Recall from (17) that /-N/ deletes before syllabic suffixes beginning with *-t*, e.g. /hiyeeqN̓tete-síiN-q/ /hiyeqʼetesíix/ 'we will be hungry' (AW502). A non-cyclic derivation would therefore wrongly predict /yiyéewN-t-'ipec/ → **yiyewʼtípec* 'merciful'. Under the cyclic regime, *-N-t* is reduced prior to the next layer of morphology, which gives the correct output.[19]

## 5.2 Argument 2: The effect of prefixes

Derivational prefixation and compounding can shift verbs from the C-class stem class into the S-class stem class (C161, C454, Cash Cash 2004: 24). These prefixes have no effect on argument structure; they just add an aspectual (Aktionsart) component to the meaning. For example, the adverbial /lamqN/ 'again', 'repeatedly' is a C-class stem, as /we-lamqN-sa/ *walámqca* 'I am repeating (words)' (*we-* 'with words'). But in some compounds it behaves as an S-class stem: /teqe-lamqN-see/ *taqalámqsa* 'I get sick again, I have a relapse' (AD307). This indicates that the stem-final floating nasal is deleted before the Imperfective suffix is added, so that the derivation is /taqa-lamqN/ → taqa-lamq → taqa-lamq-see → *taqalámqsa*/. Other examples of C-class stems becoming S-class stems under prefixation are in (46).

(46) a. i. Bare C-class stem: /hawlapiN/ → /hawlapiN-see/ → *hawlapíca* 'I feel good'
ii. Prefixed S-class stem: /hawlapiN/ → /yéq-hawlapiN/ → yéq-hawlapi → yéq-hawlapi-see →*yáx̂hawlapsa* 'I went to drink and refresh myself'

b. i. Bare C-class stem: /qiséeqN/ → /hii-qiséeqN-ee/ *hiqséex̂ne* 'he opened his mouth'
ii. Prefixed S-class stem: /hii-weye-qiséeq-e/ *hiweyeqséeqe* 'he opened his mouth wide' (AD 587)

c. i. Bare C-class stem: /tiṅukiN-see/ *tiṅkíce* 'I am dying' (C 161)
ii. Prefixed S-class stem: /'ilíw-tiṅuki-see/ *'ilíw-tiṅk-se* 'I am starving', 'I am freezing' (lit. 'freeze-dying'), /totéex-tiṅuk-see/ *téex-tiṅk-se* (C 161)

d. i. Bare C-class stem: /ʼkilikíN-see/ *ʼkilkíce* 'I am blocked' (AD 273)
ii. Prefixed S-class stem: /cúuye-ʼkiliki-see/ *cúuye'kilk-se* 'I am closing (mine) quickly' (lit. 'quick-closing')

e. i. Bare C-class stem: /toq́okiN-see/ *toq́okica* 'I am peeling' (AD 784)
ii. Prefixed S-class stem: /wíi-toq́oki-see/ *wíitq́oksa* 'I am peeking with something')

The reverse case, where an S-class stem root in combination with an derivational prefix produces a C-class stem verb, does not occur.

A cyclic derivation explains this shift and predicts its unidirectionality. In the first cycle the prefix is combined with the root or stem, and at that stage the floating nasal is deleted because it has nowhere to dock, like any final floating nasal. The cyclic derivation of (46a) is:[20]

(47) Root: /hawlapiN/ Cycle 1: /yéq-hawlapiN/ → yáq-hawlapi
Cycle 2: /yáq-hawlapi/ → yáq-hawlapi-see → *yáx̂hawlapsa*

[19]Before labials, *both* the the stem-final /-N/ and the nominalizing suffix /-t/ are deleted without leaving a trace, e.g. /ʼkóomayN-t-pa/ *ʼkóomay-pa* 'during sickness', /tiṅukiN-t-pe/ *tiṅkí-pe* 'at death', /píi-weep-ć i'yawN-t-pee/ *píiwapci'yawpa* 'during war' (AD44, AG70). I have no explanation for this.

[20]A analog would be the well-known case of Maori's floating final consonants in prefixed stems, e.g. *maur-ia* from /maur/, but causative *whaka-mau-tia*. I take the the passive suffix to be synchronically /-tia/. The stem's floating final consonant displaces the onset because of Maori's strict CV syllable canon: /maur-tia/ → *mauria* (this is the first cycle since roots are not cyclic domains). If a prefix is added, the unsyllabifiable coda is deleted on the stem cycle, and the passive is then added to the resulting vocalic form of the stem /whaka-maur/ → whaka-mau → *whakamautia*. A mirror image is the loss of French initial *h*-aspiré in some suffixally derived words (e.g. *de Hitler* but *l'hitlérisme*).

It is now clear why prefixed C-class stems become S-class stems and not the other way round. A stem-class analysis offers no explanation for this asymmetry.

Causative prefixation can also turn C-class stems into S-class stems, as in (48).

(48) a. i. Bare C-class stem: /hii-lisl̓eqiN-see/ *hi-lisl̓eqíce* 'it sticks' (AD 387)
ii. Prefixed S-class stem: /cepée-lisl̓eqi-see/ *cepée-lisl̓eqse* 'he is making it stick by pressure', /wisée-lisl̓eqi-see/ *wisée-lisl̓eq̓se* 'I am standing next to (mine)', 'I am leaning against (mine)'
i. Bare C-class stem: /sileqíN-see/ *silqíce* 'it is damp', 'it coagulates' (AD 138, 640)
ii. Prefixed S-class stem: /híi-sileqi-see/ *híisilqse* 'I dampen it' /pée-híi-sileqí-ee/ *péehisilqe* 'he moistened it'

These cases illustrate again the cyclic deletion of floating *-N* that we saw in (46).

## 5.3 Argument 3: Denominal verbs

Recall from section 3.3 that final *-n* is invariably anchored in nouns and almost always floating in verb stems. In accord with this generalization, floating /-N/ in verbs invariably corresponds to anchored /-n/ in nouns derived from them:

(49) a. C-class verb: /k̓óomayN-/ (bound stem), *k̓óomay-ca* 'I am sick'
b. Derived noun: /k̓óomayN-t/ (word), *k̓óomayn* 'sickness'

A possible example of the reverse direction of derivation is (50), where the nouns in overt *-n*, even though the cognate verbs end in a floating /-N/.

(50) a. *cíiwiin* 'bend of a river', Acc. *cíiwiin-e*,
b. *ciiwíiwiin* 'bend of a trail'
c. /ciiwíiwiiN/ 'to go around a bend of a trail', *ciwíiwiice* 'I go around a bend of trail'

However, since (50c) has no suffix it is not clear that it is actually a denominal verb.

As we saw in 3.4, affixes can also end in a floating /-N/. An example is the Incompletive Present suffix /-seeN/, whose final nasal surfaces when additional suffixes are added to it. The property that suffixes and verb stems share is that they are bound – they cannot stand as words on their own. That distinguishes them from nouns, as well as from free-standing adverbs, adjectives, interjections, and, pronouns, all of which can end in anchored /-n/ but never end in floating /-N/.

(51) a. *capáyn* 'after some time'
b. *ʔíin* 'I'
c. *qíiccayqan* [interjection expressing melancholia]

What nouns, adverbs, adjectives, pronouns, and interjections have in common is that they can be free-standing words. With the exception of interjections, they *can* receive derivational and inflectional suffixes, but they can stand on their own without them. For example, a bare noun functions syntactically as a nominative ("absolutive") case form. The generalization, then, is that a final *-n* can be floating in bound roots and suffixes, but must be anchored in words. Or putting it another way:

(52) Words must be fully syllabified.

Assuming a level-ordered morphology, we can then say that full syllabification is required at the word level but not at the stem level.

Independent evidence that nouns are words comes from another phonological fact. All nouns must be stressed, but verbs stems need not be stressed (Crook 1999: 416). Specifically, stress moves off verbs to the penultimate syllable of the word when they are followed by two or more syllables' worth of inflectional material, but this does not happen with nouns. What seems to be behind this fact is that nouns are inherently stressed on some syllable, whereas verb stems may lack inherent stress, and unstressed verbs get assigned a default stress on the penultimate syllable of the word that they are part of. This default stress rule takes effect at the word level.

# 6 Conclusion

Our findings complement the earlier work of Kiparsky 2021 by eliminating yet another theoretically problematic case of allomorphy in Nez Perce. An extension of the consonantal fusion processes proposed there provides a purely phonological account of a pervasive system of alternations that previous researchers have treated as conjugational or argument-structure conditioned morphology (section 4). The analysis also confirms the distinction between stem-level and word phonology, and the cyclic operation of the phonological derivation from the innermost stem outward (section 5). Together, these results mean that the intricate alternations in the shape of morphemes are almost entirely governed by regular phonology, and that Stratal OT provides an explanatory account of one of the most intricate phonological systems so far uncovered.

# References

Alexiadou, Artemis, 2014. The problem with internally caused change-of-state verbs. *Linguistics*, 52(4): 879–909.

Alexiadou, Artemis, Elena Anagnostopoulou, and Florian Schäfer, 2006. The properties of anti-causatives cross-linguistically. In M. Frascarelli (ed.), *Phases of Interpretation*, pp. 187–212. Berlin: Mouton.

——, 2015. *External arguments in transitivity alternations: a layering approach*. Oxford: Oxford University Press.

Aoki, Haruo, 1970. *Nez Perce grammar*. Berkeley: University of California Press.

——, 1979. *Nez Perce texts*, volume 90 of *University of California Publications in Linguistics*. Berkeley and Los Angeles: University of California Press.

——, 1994. *Nez Perce dictionary*. Berkeley: University of California Press.

Aoki, Haruo and Deward E. Walker, 1988. *Nez Perce Oral Narratives*. Berkeley, CA: University of California Press.

Ausensi, Josep and Anna Pineda, 2025. On hybrid verb classes: The view from meal verbs in Romance. *Acta Linguistica Academica*, 72(2): 295–318.
DOI:10.1556/2062.2025.01000

Cash Cash, Philip, 2004. Nez Perce verb morphology. ms. https://linguistics.ucla.edu/images/stories/crook.1999.pdf. Available from the Scribd repository.

Copley, Bridget and Heidi Harley, 2015. A force-theoretic framework for event structure. *Linguistics and Philosophy*, 38(2): 103–158.

Crook, Harold, 1999. *The Phonology and Morphology of Nez Perce Stress*. Ph.D. thesis, UCLA, Available from Scribd repository.

Crosswhite, Katherine, 1998. Segmental vs. prosodic correspondence in chamorro. *Phonology*, 15: 281–316.

Deal, Amy Rose and Matthew Wolf, 2016. Outward-sensitive phonologically conditioned allomorphy in Nez Perce. In Vera Gribanova and Stephanie Shih (eds.), *The Morphosyntax-Phonology Connection: Locality and Directionality at the Interface*, pp. 29–60. Oxford: Oxford University Press.

Everaert, Martin, Marijana Marelj, and Tal Siloni, 2012. The theta system: An introduction. In Tal Siloni Martin Everaert, Marijana Marelj (ed.), *The Theta System: Argument Structure at the Interface*, Oxford Studies in Theoretical Linguistics. Oxford: Oxford University Press.

Harley, Heidi, 2008. On the causative construction. In Shigeru Miyagawa (ed.), *The Oxford Handbook of Japanese Linguistics*. Oxford: Oxford Handbooks Online.

Hayes, Bruce, 1986. Inalterability in CV phonology. *Language*, 62(2): 321–251.

Irwin, P.atriciia, 2018. Existential unaccusativity and new discourse referents. *Glossa: a journal of general linguistics*, 3(1).

Kenstowicz, Michael, 1994. *Phonology in generative grammar*. Oxford: Blackwell.

Kiparsky, Paul, 2021. Phonology to the rescue: Nez Perce revisited. *The Linguistic Review*, 38(3): 391–442.

Kural, Murat, 2002. A four-way classification of monadic verbs. In Alexiadou Artemis (ed.), *Theoretical approaches to universals*, pp. 139–163. Amsterdam and Philadelphia: John Benjamins.

Levin, Beth and Malka Rappaport Hovav, 2005. *Unaccusativity: At the Syntax–Lexical Semantics Interface*. Cambridge: MIT Press.

McCarthy, John J. and Alan S. Prince, 1995. Prosodic morphology. In John Goldsmith (ed.), *The Handbook of Phonological Theory*. Cambridge, Mass: Blackwell.

Pater, Joe, 1999. Austronesian nasal substitution and other *n̩c effects. In René Kager, Harry van der Hulst, and Wim Zonneveld (eds.), *The Prosody-Morphology Interface*. Cambridge: Cambridge University Press.

Pineda, Anna and Ane Berro, 2020. Hybrid intransitives in basque. *Glossa*, 5(1): 1–28.

Rappaport Hovav, Malka, 2020. Deconstructing internal causation. In Elitzur A. Bar-Asher Siegal and Nora Boneh (eds.), *Perspectives on Causation: Selected Papers from the Jerusalem 2017 Workshop*, pp. 219–255. Springer.

Reinhart, Tanya, 2016. *Concepts, Syntax, and their Interface: The Theta System*. Cambridge, MA.: MIT Press.

Rosen, Carol, 1984. The interface between semantic roles and initial grammatical relations. In D. Perlmutter and C. Rosen (eds.), *Studies in Relational Grammar*, volume 2. Chicago: University of Chicago Press.

Rude, Noel, 1985. *Studies in Nez Perce Grammar and Discourse*. Ph.D. thesis, University of Oregon, Eugene.

Schein, Barry and Donca Steriade, 1986. On geminates. *Linguistic Inquiry*, 17: 691–744.

Tollan, Rebecca and Diane Massam, 2022. Licensing unergative objects in ergative languages: The view from polynesian. *Syntax*, 25(2): 242–275.

Wunderlich, Dieter, 1994. Minimalist morphology: An approach to inflection. *Zeitschrift für Sprachwissenschaft*, 20: 236–294.

——, 1996. Minimalist morphology: The role of paradigms. In Geert Booij and Jaap van Marle (eds.), *Yearbook of Morphology 1995*. Dordrecht: Kluwer.

Zaenen, Annie, 1993. Unaccusativity in Dutch: Integrating syntax and lexical semantics. In James Pustejovsky (ed.), *Semantics and the Lexicon*, pp. 129–161. Kluwer Academic Publishers.