

Clause-type, Transitivity, and the Transitive Vowel in Tsimshianic*

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Abstract: This paper demonstrates the existence of an underlying schwa (the ‘transitive vowel’) differentiating verb stems of different clause types in both Interior and Maritime Tsimshianic. Using novel data from fieldwork we clarify the distribution of ‘biargumental’ morphology and the ‘Inserted Vowel’ discussed in Sasama (2001), unifying a subset of both cases under a single analysis of the transitive vowel, and confirm the distribution of the transitive vowel suggested by Forbes (2018). We show that the transitive vowel is present if and only if ergative agreement takes place and is realized with the Series II agreement suffixes: in Independent-order clauses and object extraction. We review specific phonological and morphological processes that impact its realization in these contexts for both Interior and Maritime Tsimshianic, as well as processes that produce surface-identical vowels in contexts where it is not expected. The processes are generally similar but have some important differences that have obscured recognition of the vowel in prior literature on Maritime Tsimshianic. This work therefore constitutes an important step in our understanding of Sm’algyax (Coast Tsimshian) morphology and phonology, informed by Tsimshianic-internal comparison.

Keywords: Tsimshianic, clause types, morphology, phonology, transitivity, ergativity

1 Introduction

In Gitksan and Nisga’a (Interior Tsimshianic, henceforth IT), a suffixal vowel often appears at the end of transitive verb stems in the Independent order:¹

* ‘Wii t’isim ha’miyyaa ’nuu’*m* to our Gitksan consultants, Barbara Sennott (BS), Vince Gogag (VG), Hector Hill (HH), and Jeanne Harris (JH), and ‘ap luk’wil t’oyaxsmt ’nüüsm to our Sm’algyax consultants Velna Nelson (VN), Beatrice Robinson (BR), and Ellen Mason (EM). We also thank our peers and colleagues in the UBC Gitksan Research Lab, Margaret Anderson and Fumiko Sasama, as well as those who have provided feedback on previous works containing these ideas. This research has been supported by a SSHRC Doctoral Fellowship for the first author, SSHRC Doctoral and Postdoctoral Fellowships awarded to the second author, and a Joseph-Armand Bombardier Canada Graduate Scholarship, SSHRC Insight Grant 435-2015-1694 (PI Henry Davis), and Jacobs Research Fund grants for the third author. Authors are listed alphabetically by last name — author order does not reflect contributions.

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¹ 1 = first person, 2 = second person, 3 = third person, ATTR = attributive, AX = agent (transitive subject) extraction, CAUS = causative, CN = common noun connective, CNTR = contrastive, DM = determinate noun connective, EPIS = epistemic, FOC = focus, I = Series I clitic, II = Series II suffix, III = Series III pronoun, NEG = negative, OBL = oblique, PFV = perfective, PL = plural, PN = proper noun connective, PREP = preposition, PROG = progressive, PROSP = prospective, Q = question particle, SG = singular, SX = (intransitive) subject extraction, TR = transitive.

- (1) a. Gi'namis Henryhl wineex as Aidan.
 gi'nam-ə(-t)=s Henry=hl wineex a(-t)=s Aidan
 give-TR(-3.II)=DM Henry=CN food OBL(-3.II)=DM Aidan
 ‘Henry gave food to Aidan.’ G (Forbes 2018)
- b. Hooyithl gangigyookst.
 hoox-ə-t=hl gangigyooks-t
 wear-TR-3.II=CN life.jacket-3.II
 ‘She wore her lifejacket.’ N (Tarpent 1987)

This suffix, referred to as ‘control’ in Tarpent (1987) and as a ‘transitive theme suffix’ in Rigsby (1986), has an established and well-defined distribution, and is referenced in the vast majority of the literature on Gitksan and Nisga’a. Although verb stems in Sm’algyax (Coast Tsimshian, CT), a closely related language from the Maritime Tsimshianic branch, also sometimes exhibit a suffixal vowel in the same location, existing descriptions in the literature do not provide a systematic account of its appearance. They furthermore make no reference to what we might expect: a potential cognate of the IT vowel.

In this paper we demonstrate that by analyzing CT Independent order clauses as involving a cognate vowel, with almost exactly the same distribution as the one discussed in the IT literature, we can provide a principled account of the distribution of stem vowels in CT, while at the same time shedding light on predictable processes of epenthesis and deletion. We argue that in both branches of Tsimshianic, the vowel systematically occurs in transitive Independent order clauses and object-extraction constructions (including focus, relative clause and *wh*-constructions). However, phonological and morphophonological alternations obscure the presence of the vowel in both branches, in different ways, and the CT distribution is further obscured by agreement alternations in the Independent order not found in IT. We present a detailed discussion of the morphophonology of the transitive vowel in both branches of the Tsimshianic family, and give a comprehensive account of the distribution of this morpheme in CT. We conclude that the transitive vowel must be taken into account as part of the basic inflectional marking of Independent-order transitive clauses and object-extraction constructions across Tsimshianic.

The layout of this paper is as follows: in Section 2 we present background on Tsimshianic morphosyntax and a review of prior literature on the transitive vowel, outline the distribution of the transitive suffix in Gitksan and Nisga’a, and introduce the basic agreement patterns and clause type distinction that affect the presence of the transitive vowel. We also discuss phonological processes in the interior branch that obscure this suffix’s presence. In Sections 3 and 4 we present detailed phonological and morphological conditions governing the realization of the transitive vowel, first for Gitksan (and Nisga’a: IT) and second for Sm’algyax/Coast Tsimshian (CT). We show that the transitive vowel appears in CT as well, with a similar overall distribution as discussed for IT, and is similarly obscured by the phonology (albeit by different phonological rules, which we outline). In Section 5 we review agreement alternations in CT Independent clauses and demonstrate that the transitive vowel co-occurs only with an ergative Series II suffix. In this way, we clarify the distribution of ‘biargumental’ morphology and the ‘Inserted Vowel’ discussed in Sasama (2001), unifying a subset of both cases under a single analysis of the transitive vowel, and confirm the distribution of the transitive vowel in CT suggested by Forbes (2018) based on patterns in IT. In Section 6 we conclude by outlining the overall environments in which the transitive vowel appears in both branches, as well as similarities and differences in the phonological and morphological processes affecting its realization.

2 Background

The Tsimshianic languages are indigenous to northern British Columbia, Canada, and are located along the Skeena and Nass watersheds. The family is composed of two main branches and four recognized languages, as illustrated in (2).

- (2) a. *Maritime Tsimshianic*: Sm'algyax/Coast Tsimshian (CT), Sgüüxs/Southern Tsimshian (ST)
 b. *Interior Tsimshianic (IT)*: Nisga'a (N), Gitksan (G)

Discussion in this paper will review both branches of the family, with examples from Nisga'a and Gitksan from Interior Tsimshianic and CT from Maritime. Examples throughout are presented with a citation when taken from prior literature, and with the contributing speaker's initials when from the authors' primary fieldwork (on Gitksan and CT). In this section we present some background on Tsimshianic morphosyntax, and the transitive vowel identified in the Interior branch.

2.1 Tsimshianic morphosyntax

The Tsimshianic languages are closely related and share many morphosyntactic features. The languages are verb-initial, with most clauses exhibiting VSO order, as illustrated in (3) for the Interior and (4) for the Maritime branch.

- (3) Hlimooyis Tomhl nakst.
 hlimoo-ə(-t)=s Tom=hl naks-t
 help-TR(-3.II)=PN Tom=CN wife-3.II
 'Tom helped his wife.' G (Rigsby 1986)

- (4) Nah hlimooms Meeli 'yuuta.
 nah hlimoom(-ə-t)=s Meeli=a 'yuuta
 PFV help(-TR-3.II)=DM Mary=CN man
 'Mary helped the man.' CT (VN)

Most importantly for the purposes of this paper, all Tsimshianic languages exhibit a major split in the inflection of two different clause types: what we will refer to as the INDEPENDENT versus DEPENDENT orders.² There are a number of morphemes and morphosyntactic constructions which trigger this distinction, some of which are listed in Table 1.

The two clause types most obviously differ in terms of the agreement and pronominal marking used in each. Though the specific details differ across the Interior and Maritime branches, in general

² These are referred to as 'indicative' and 'subjunctive' clauses by Boas (1911) and subsequent work on Sm'algyax, and 'Independent' and 'dependent' clauses by Rigsby (1986) and subsequent work on Gitksan. We adopt Rigsby's terms 'Independent' and 'dependent' as they are the most descriptively accurate and theory-neutral. As Davis (2018) points out, this clause-type distinction is orthogonal to mood, and thus the terms indicative/subjunctive are misleading. Tarpent (1987) refers to these clause types as 'predicate focused' and 'regular clauses', respectively. The terminology used in Tarpent (1987) reflects a specific analysis in which the predicate undergoes topicalization in Independent clauses. We do not adopt this analysis here.

Table 1: Types of Dependent order triggers (Rigsby 1986; Tarpent 1987)

Type		Examples
Clausal Subordination	<i>G</i>	ii, wil/win, wila, needii, ji, <u>gan</u> , ts'i
	<i>CT</i>	ada, wil, wila/la, aka(dii)/afga(dii), dzi, <u>gan</u> , ts'u
Aspectual Markers	<i>G</i>	yukw, hlaa, hlis
	<i>CT</i>	yagwa, ła
Temporal Morphemes	<i>G</i>	ganiwila, gaks, hli ^{daa}
	<i>CT</i>	adigwil, dzida
Syntactically Determined	<i>G+CT</i>	imperatives, discourse-dependent coordination, focus

Independent order clauses involve an ergative verbal suffix, as illustrated in (5). Dependent order clauses involve a preverbal ergative clitic, and an absolutive verbal suffix, as in (6).³

- (5) a. T'isi'yt Henry.
t'is-ə-'y=t Henry
hit-TR-1.II=DM Henry
'I hit Henry.' G (VG)
- b. T'uusut Henry.
t'uus(-ə)-u=t Henry
hit-TR-1.II=PN Henry
'I hit Henry.' CT (VN)
- (6) a. Neediit t'isi'yt Henry.
nee=dii=t t'is-'y=t Henry
NEG=FOC=3.I hit-1.II=DM Henry
'Henry didn't hit me.' G (VG)
- b. Akadit t'uusut Henry.
aka=di=t t'uus-u=t Henry
NEG=FOC=3.I hit-1.II=PN Henry
'Henry didn't hit me.' CT (VN)

The two clause types also play a role in the morphosyntax of \bar{A} -extraction and fronting, a system which again is near-identical across Tsimshianic. In the Tsimshianic \bar{A} -extraction system, all clauses with some type of \bar{A} -movement, including *wh*-questions, relative clauses, and clefts, have some distinguishing morphological features that provide a cue to the grammatical role of what has been extracted. The remnant clauses from which ergative subjects and obliques are extracted exhibit the Dependent order pattern of agreement, in which ergatives are marked by the preverbal clitic, while remnant clauses from which an object has been extracted must exhibit the Independent order pattern, in which ergatives are marked by the verbal suffix (Rigsby 1986; Tarpent 1987 on IT; Dunn 1979 and Forbes 2018:164 on CT).

³ We gloss the preverbal clitics as Series I and the verbal suffixes as Series II, following Rigsby's (1986) terminology. In the CT literature, these paradigms have respectively been referred to as subjective/objective (Dunn 1979) or ergative/absolutive (Anderson and Ignace 2008).

2.2 Background on the transitive vowel

A second key diagnostic which distinguishes the two orders, at least in the literature on Interior Tsimshianic, is what we refer to in this paper as the TRANSITIVE VOWEL (glossed TR). This is a vowel which appears on transitive verb stems in the Independent order (7a), but not the Dependent order (7b). The transitive vowel is also obligatory on the verb stems of object extraction constructions (7c).

- (7) a. Jebis Cindyhl ha'niit'aa.
 jep-ə(-t)=s Cindy=hl ha'niit'aa
 make-TR(-3.II)=PN Cindy=CN chair
 ‘Cindy made a chair.’
- b. Neediit jeps Cindyhl ha'niit'aa.
 nee=dii=t jep(-t)=s Cindy=hl ha'niit'aa
 NEG=FOC=3.I make(-3.I)=PN Cindy=CN chair
 ‘Cindy didn’t make a chair.’
- c. 'Melhl jebis Aidan.
 'mel=hl jep-ə(-t)=s Aidan
 canoe=CN make-TR(-3.II)=PN Aidan
 ‘A canoe is what Aidan made.’ G (VG)

This morpheme was first identified as such by Tarpent (1987), who glossed it as a marker of ‘grammatical control (CTL)’, used specifically in clauses where the Series II agreement suffix on the verb referred to the ergative subject, rather than an absolutive argument.⁴ It was later glossed as a ‘transitive marker’ by Hunt (1993), who argued specifically that this vowel did not alternate with lexical or productive transitivizers, which appear consistently on verb stems regardless of the clause order, but rather co-occurred with these transitivizers in only the Independent order.

To summarize, the vowel appears immediately preceding Series II suffixal agreement on the predicate, but following valency-related suffixes like transitivizers. Dependent-order clauses differ from Independent order and object-extraction clauses as illustrated in the following templates:

- (8) a. **Independent/O-extr:** V [prefixes-Root-suffixes]-ə-Agr.II_{ERG}
 b. **Dependent/A-extr:** V [prefixes-Root-suffixes]-Agr.II

We propose the following cross-Tsimshianic generalization, following Tarpent (1987):

- (9) **Transitive vowel generalization:** An underlying vowel is present on verb stems in the Independent order and in object extraction, immediately preceding a Series II agreement suffix referencing the ergative subject.

⁴ This is an accurate description of the vowel’s distribution for Coast Tsimshian, but Hunt (1993) and Davis and Forbes (2015) demonstrate that there is an additional context in IT where suffixal agreement refers to the ergative subject but the transitive vowel does *not* appear: dependent clauses when the subject is a DP or third-plural pronoun. The emergence of this more innovative construction obscures what may have been the original conditioning factor for the transitive vowel (an ergative Series II suffix, discussed further in Section 5), instead presenting an alternative generalization for the Interior that the alternation is conditioned strictly by clause type.

Crucially, the transitive vowel can only appear on transitive verbal predicates. Its absence in some apparently-transitive Independent clauses, such as (10), helps us identify that the predicate in question (here: *hasak* ‘want/desire’) is in fact a possessed noun.

- (10) a. *Hasak*thl miyup.
 *hasak*t=hl miyup
 want-3.II=CN rice
 ‘S/he wants (some) rice.’ (Lit: Her desire is rice.)
- b. **Hasagathl* miyup. G (Rigsby 1986:286)

This can be confirmed via \bar{A} -extraction: the apparent subject of *hasak* extracts like a nominal possessor in (11), using *-ət* ‘-sx’, rather than like an ergative subject, with *an* ‘AX’.

- (11) a. Naahl *hasagat* dim yeet?
 naa=hl *hasak*-ət dim yee-3.II
 who=CN want-sx PROSP go-3.II
 ‘Who wants to go?’
- b. *Naa **ant** *hasakhl* dim yeet? G (VG)

This provides additional basis for the relevance and importance of identifying the transitive vowel. It allows us to better categorize predicates on the basis of valence and category, properties which affect the morphology of the predicate in Independent clauses, Dependent verb stems, and extraction contexts.

Prior to Tarpent (1987), and in most of the Sm’algıax literature, the transitive vowel was either treated as epenthetic, or analyzed in conjunction with transitivizing morphology immediately preceding, and treated as a transitivizer or bi-argumental marker (Rigsby 1986; Sasama 2001). This was not without reason: surface identification of the transitive vowel in Independent order and object extraction clauses is not straightforward. In both Interior Tsimshianic and, as we argue, Maritime Tsimshianic, there are several phonological and morphophonological conditions which either delete the transitive vowel from the surface string in the expected contexts, or insert an identical vowel in other contexts, making the appearance of a stem-final vowel seem potentially arbitrary. As we will demonstrate, the conditions for stem-final vowels in both the Interior and Maritime branches are complex but crucially not random.

3 Distribution of the transitive vowel in IT

In Interior Tsimshianic, there are several factors which obscure the realization of the transitive vowel, leaving verb stems to be pronounced identically in both the Independent and Dependent orders. Recall, we propose that Independent-order verb stems bear an underlying vowel, and that Dependent-order verb stems do not bear this vowel. Independent-order verb stems which have *no* vowel must therefore be demonstrable instances of (morpho)phonologically-conditioned vowel deletion; Dependent-order verb stems which *do* contain a vowel must involve vowel epenthesis, or else the vowel must be traced to some other morpheme.

We here collect argumentation from various sources demonstrating that these predictions hold. A phonological or morphological source can be identified for every absent vowel in the Independent

order and unexpected vowel in the Dependent order. We review three sources for opacity affecting the position between the verb stem and agreement suffix or connective: (morpho)phonological conditions on vowel epenthesis; morphophonological conditions on vowel deletion, including before third-plural agreement; and verb stems ending in what we refer to as ‘big T’⁵, a poorly-understood and partially-lexicalized transitivity or applicative sometimes realized as a vowel. In the final subsection we summarize the surface pattern of the transitive vowel across clause types based on these conditions.

3.1 Epenthesis conditions (IT)

There are a number of epenthesis processes that apply to the area where the transitive vowel is found, where the predicate meets suffixal agreement. Specifically, vowel epenthesis commonly occurs between the predicate stem and agreement/connective in Dependent order clauses, resulting in stems identical to their Independent order counterparts where the transitive vowel is underlying present. Epenthesis processes can significantly obscure the vowel’s presence for this reason; however, simply changing the agreement suffix or connective enclitic often makes the phonological environment for epenthesis vanish, and the predictable distinction reappear.

The most common type of contrast-neutralizing vowel epenthesis occurs when the predicate stem ends in a consonant (either obstruent T, or sonorant R) and the following element begins with a sonorant (R) (Rigsby 1986:217). This is the case for agreement in the first-person (1SG: -’y, 1PL: -’m) and second-person singular (2SG: -n). This stem-final /...C-R/ sequence requires insertion of a vowel to be properly syllabified, resulting in [...CəR], identical to underlying /...C-ə-R/ involving the transitive vowel. Consequently, stem + affix combinations with these phonological properties look identical in Independent clauses and Dependent clauses: an obstruent-final stem is illustrated in (12) and a sonorant-final stem in (13).⁶

(12) Obstruent-final stem + sonorant-initial suffix/enclitic:

- | | | | |
|----|--|-----------------|-------|
| a. | Gubi’yhl | smex. | |
| | gup-ə-’y=hl | smex | |
| | eat-TR-1.II=CN | bear | |
| | ‘I ate the bear.’ (<i>Independent</i>) | | |
| b. | Neediit | gubi’yhl | smex. |
| | nee=dii=t | gup-’y=hl | smex |
| | NEG=FOC=3.II | eat-1.II=CN | bear |
| | ‘The bear didn’t eat me.’ (<i>Dependent</i>) | | |
- G (VG)

⁵ Coined ‘big T’ after Tarpent (1986) where this morpheme is simply glossed with a capital (‘big’) T.

⁶ No observable difference in quality has been observed between the epenthetic vowel and the underlying transitive vowel; thus, both are represented as underlying underspecified vowel, represented as schwa, and their quality determined predictably through consonant-colouring rules (Brown, Davis, Schwan, and Sennott 2016; Rigsby 1986). Generally, adjacent to a uvular, vowel quality will be low e.g. within the range of [ʌ] to [a]. Preceding labiovelars, or between two labials, vowel quality will be high back and rounded, e.g. [ɔ] to [u]. Elsewhere, these vowels will be high front, around [ɪ] and [i].

(13) Sonorant-final stem + sonorant-initial suffix/enclitic:

- a. **Gini'y** 'niin ahl anaax.
 gin-ə-'y 'niin a=hl anaax
 feed-TR-1.II=CN 2.III PREP=CN bread
 'I fed you bread.' (*Independent*)
- b. Neemdii **gini'y** ahl anaax.
 nee=m=dii gin-'y a=hl anaax
 NEG=2.II=FOC feed-1.II PREP=CN bread
 'You didn't feed me bread.' (*Dependent*)

G (VG)

When instead a stem is suffixed with an obstruent-initial morpheme, there is no process of epenthesis (seen with agreement 2PL: *-si'm*, 3SG: *-t*, or connectives *=t*, *=hl*). A contrast can therefore be observed on the verb stem when these morphemes are appended. In (14) and (15), the Independent predicates in the (a) examples clearly differ from the Dependent predicates in the (b) examples. We attribute this to the presence of the transitive vowel in the Independent clauses: underlying /...C-ə-T/ is realized [...CəT], while Dependent /...C-T/ remains [...CT].

(14) Obstruent-final stem + obstruent-initial suffix/enclitic:

- a. **Gubithl** anaax.
 gup-ə-t=hl anaax
 eat-TR-3II=CN bread
 'She ate the bread' (*Independent*)
- b. Neediit **gupt.**
 nee=dii=t gup-t
 NEG=FOC=3.I eat-3.II
 'She didn't eat it.' (*Dependent*)

G (VG)

(15) Sonorant-final stem + obstruent-initial suffix/enclitic:

- a. **Ginit** 'nit ahl anaax.
 gin-ə-t 'nit a=hl anaax
 feed-TR-3.II 3.III PREP=CN bread
 'She fed him bread.' (*Independent*)
- b. Neediit **gint** ahl anaax.
 nee=dii=t gin-t a=hl anaax
 NEG=FOC=3.I feed-3.II PREP=CN bread
 'He didn't feed her bread.' (*Dependent*)

G (VG)

This can be attributed to a general condition on the distribution of sonorants (Rigsby 1986:217). Sonorants added to a predicate with a consonant already in coda position are in violation of the Sonority Hierarchy, so a vowel must be added to properly license them.⁷ The same process also occurs regularly on stems to which the attributive suffix *-m* has been added.

⁷ Note that the addition of a second-position clitic such as *=ima(')a* 'EPIS' to the verb stem does not affect the application of epenthesis. Second-position clitics therefore do not seem to be part of the prosodic unit where vowel epenthesis and/or syllabification takes place.

There is a second epenthesis process resulting in conflation of the surface forms of Independent and Dependent order predicates. When the stem ends in a sibilant consonant (s, ts, ts') and the following element is the sibilant-initial second-person plural *-si'm*, then a vowel is typically inserted to resolve 'hiatus' between the two sibilants. Consequently, Independent and Dependent order stems in this specific context look identical, as illustrated in (16).

(16) Sibilant-final stem + *si'm*:

a. **T'isisi'mt** Henry.
 t'is-ə-si'm=t Henry
 hit-TR-2PL.II=PN Henry
 'Y'all hit Henry. (*Independent*)

b. Neediit **dist'isisi'm.**
 nee=dii=t dis~t'is-si'm
 NEG=FOC=3.I PL~hit-2PL.II
 'He didn't hit you all.' (*Dependent*)

G (VG)

This type of epenthesis only occurs before the second-person plural. Sibilant-final stems followed by the sibilant connective *s* simply delete the connective (just as sequences of doubled lateral fricatives *hl* are also resolved by deletion). Epenthesis does not occur between sibilants joined across a compound (Tarpent 1987:875).

While epenthesis processes applying to consonant-final stems make the presence of the transitive vowel more opaque, vowel-final stems make its distribution clear. This is due to a process of glide epenthesis that occurs between the final vowel of the predicate and the following transitive vowel to resolve vowel hiatus. The presence of this glide distinguishes Independent and Dependent order clauses for any vowel-final stem, regardless of what else is suffixed or encliticized, as illustrated in (17).⁸

(17) Vowel-final stem + suffix/enclitic:

a. **'Weyit** 'nit.
 'we-yə-t 'nit
 find-TR-3.II 3.III
 'He found him.' (*Independent*)

b. Neediit **'wet.**
 nee=dii=t 'we-t
 NEG=FOC=3.I find-3.II
 'He didn't find him.' (*Dependent*)

G (VG)

In summary, two processes of vowel epenthesis occur in Dependent order clauses: the first is between a stem's coda and a sonorant-initial suffix, and the second is between a sibilant and *-si'm*.

⁸ Glide insertion is not universally used to resolve vowel epenthesis. Certain vowel-initial morphemes such as the transitive vowel, epistemic clitic =*ima*(')a, and question marker =*aa* resolve hiatus with epenthesis, while others such as the subject extraction marker *-it* resolve hiatus with vowel deletion. It is unclear whether this difference is best handled as a morphophonological difference in these morphemes themselves, or perhaps as a difference in the prosodic domain at which each of these morphemes attach; we do not discuss it further.

The outcome of these regular processes make such stem-suffix combinations indistinguishable from Independent order clauses which involve an underlying, non-epenthetic vowel (the transitive vowel). Vowel-final stems, by contrast, are made more distinct across the two orders by a process of glide epenthesis before the transitive vowel.

3.2 Deletion conditions: stress and third-plural *-dii* (IT)

Two processes of vowel deletion can also be identified in the Independent order, identified by Tarpent (1987) for Nisga'a and Hunt (1993) for Gitksan. These processes remove the surface realization of the transitive vowel, leaving affected verb stems identical to their Dependent order counterparts where no transitive vowel is present.

The first of these processes is a phonological deletion process when the stem ends in a sonorant. This process applies differently depending on the stress pattern of the stem. For monosyllabic and final-stress stems such as those in (18), the transitive vowel in Independent clauses is often reduced, but speakers are clearly aware of a contrast across clause types. The vowel seems to retain its syllabic weight, and may either remain a separate vowel or trigger a lengthened preceding sonorant; in eliciting (18a), VG suggested a spelling *ginnt* to contrast with *gint*.⁹

(18) Sonorant-final stem: monosyllabic:

a. **Ginit** 'nit ahl anaax.
 gin-ə-t 'nit a=hl anaax
 feed-TR-3.II 3.III PREP=CN bread
 'She fed him bread.' (*Independent*)

b. Neediit **gint** ahl anaax.
 nee=dii=t gin-t a=hl anaax
 NEG=FOC=3.I feed-3.II PREP=CN bread
 'He didn't feed her bread.' (*Dependent*)

G (VG)

In contrast, verb stems with a final sonorant but non-final stress exhibit complete vowel deletion. There is no vowel in either order: the stems in (19) are identical.

(19) Sonorant-final stem: pre-final stress:

a. **Kw'esinthl** wo'os.
 kw'es-in-t=hl wo'os
 break-CAUS-3.II=CN bowl
 'He broke the bowl.' (*Independent*)

b. Neediit **kw'esint**.
 nee=dii=t kw'es-in-t
 NEG=FOC=3.I break-CAUS-3.II
 'He didn't break it.' (*Dependent*)

G (VG)

⁹ According to Tarpent (1987:628), the transitive vowel in Nisga'a is deleted after a glottalized sonorant, i.e. stems of the form CVR' are non-contrastive with respect to the presence or absence of the transitive vowel. In our replication of these contexts, variants like *gi'lt~gi'lit* for 'He/she dug it up' were both judged as acceptable, with the speaker noting that the first is easier to say. The speaker's awareness of the difference and acceptance of both versions suggests not a phonological deletion process in Gitksan, but rather a more surface level of fast-speech reduction.

The major examples of this are transitive stems ending in the causative suffix *-in*, leading to the surface observation that *-in* and the transitive vowel are in complementary distribution. This forms the basis for Rigsby's (1986) original conclusion that the transitive vowel is a type of transitivizer. However, Hunt (1993) notes that rare stems of the same phonological shape but lacking the causative, such as *kw'oodil* 'lose sight of', also lack the transitive vowel in the Independent order, suggesting a phonological rather than morphological motivation for the transitive vowel's absence. She further remarks that the vowel in the intransitive subject extraction suffix *-it* deletes under the same conditions: following an unstressed syllable ending in a sonorant (Hunt 1993:233). In our reproduction of this claim, the speaker's volunteered version never had a vowel after the stem-final sonorant, but judgements varied with regard to whether reinserting it was acceptable.¹⁰

- (20) a. Guhl gay aapxint? (??aapxinit)
 gu=hl gay aapxin-ət
 what=CN CNTR lightweight-sx
 'Which one is light?'
 b. Naahl haahlxant tun? (??haahlxanit)
 Naa=hl haahlxan-ət tun?
 who=CN wall-sx this
 'Whose wall is this?'

G (VG)

This contrasts with the behavior of monosyllabic forms with stress-adjacent sonorants. Just as with the transitive vowel, the schwa in the subject extraction morpheme *-it* is merely reduced after such stems, but speakers retain it with no trouble (e.g. *bant*~*bannt*~*banit* 'whose belly').

Given that multiple schwa-containing morphemes undergo the same pattern, we see clear basis for a phonological process whereby a schwa is deleted following the sonorant coda of an unstressed syllable, at a deeper level than fast-speech reduction (Hunt 1993:231). This conclusion supports the idea that an underlying vowel is categorically present in Independent-order clauses. This vowel co-occurs (underlyingly) with the causative suffix *-in*, but they cannot be successfully syllabified together on the surface.

The final deletion condition is a morphological one unique to the Interior Tsimshianic branch. The third-plural agreement suffix *-diit*, innovated after the divergence of the Interior and Maritime Tsimshianic branches, never co-occurs with the transitive vowel, no matter what phonological shape the stem has. The examples in (21–23) demonstrate that (a) utterances with the agreement marker *-diit* do not exhibit a vowel, though we have seen previously with other agreement markers that the vowel would be required; (b) insertion of the vowel is categorically unacceptable.

- (21) a. T'isdiit 'nit.
 t'is-diit 'nit
 hit-3.II 3.III
 'They hit him.'
 b. *T'isidiit 'nit.

¹⁰ Further elicitation on these points is certainly necessary; we have a few data points to suggest that the surface form of *-ət 'sx'* may differ in verbal extraction contexts (like (20)) versus relative clauses (*aapxint*~*aapxinit* 'the light one').

(22) a. Gindiithl tk'ihlxum get ehl anaax.
 gin-diiit=hl tk'ihlxw-m get e=hl anaax
 feed-3.II=CN child-ATTR man PREP=CN bread
 'They fed the boy bread.'

b. *Ginidiithl tk'ihlxum get ehl anaax.

(23) a. Hlimoodiithl us.
 hlimoo-diiit=hl us
 help-3.II=CN dog
 'They helped the dog.'

b. *Hlimooyidiithl us.

It is difficult to account for this deletion on phonological grounds; we take it to be morphologically conditioned.¹¹

3.3 Morphological interaction between TR and big T (IT)

Finally, there are certain verb stems which surface with a vowel in Dependent clauses, even between obstruents, in precisely the conditions that we have to this point suggested should have no vowel. Certain verbs such as *mahl* 'tell' and *jakw* 'kill' are examples of such stems. It turns out that these verbs, illustrated in (24), inflect somewhat differently in both Independent and Dependent clauses, compared to 'standard' verbs like *gup* 'eat' in (25).

(24) a. Mehdithl ant'imehlasxw ehl wekt.
 mehl-T-ə-t=hl ant'imehlasxw e=hl wek-t
 mehl-T-TR-3.II=CN story PREP=CN brother-3.II
 'He told a story to his brother.' G (VG)

b. Yukwt mehlit ehl wekt.
 yukw=t mehl-T-t e=hl wek-t
 PROG=3.I tell-T-3.II PREP=CN brother-3.II
 'He is telling it to his brother' G (VG)

(25) a. Gubithl anaax.
 gup-ə-t=hl anaax
 eat-TR-3.II=CN bread
 'She ate the bread.' G (VG)

b. Neediit gupt.
 nee=dii=t gup-t
 NEG=FOC=3.I eat-3.II
 'She didn't eat it.' G (VG)

¹¹ Tarpent (1983, 1987) suggests that historically, third-plural *-diiit* may have been composed of two elements which sandwiched the transitive vowel between them: a pluralizer **-deh* and third-person agreement **-t*. While plural *-diiit* is now viewed as an atomic unit, not as something within which other morphemes are contained, this characteristic of its origin lingers on in its morphologically-conditioned deletion of the transitive vowel.

While a regular verb stem taking third-person agreement will surface with *-it* in an Independent clause and plain *-t* in a Dependent clause, verbs like *mahl* ‘tell’ and *jakw* ‘kill’ will surface with *-dit* and *-it*, respectively, each time with a vowel.¹² Descriptively, these verbs have a suffixed vowel in both clause types, and have an added [d] in Independent clauses.

Further insight is provided by Tarpent (1987). She notes that Nisga’a exhibits both transitive and intransitive verb or adjective stems bearing some suffix which is sometimes realized as [t]/[d], and sometimes as a vowel. She refers to this suffix via the abstract form /-T/, and glosses it ‘definite medial’. A basic generalization for its realization is as follows: the suffix is realized as *-t* when it is the final element in the word, typically in isolation, as in (26a). The suffix is a vowel when it is followed by an agreement suffix, as in (26b) and (26c).¹³ Finally, the suffix is realized as [d] when it is followed by a vowel, as in (26d) where we predict the transitive vowel to occur.

- (26) a. kw’ast
kw’as-T
broken-T
‘be broken (into pieces); shattered’ N (Tarpent 1987:635)
- b. Hlaa kw’asit.
hlaa kw’as-T-t
broken-T-3.II
‘Now it is broken.’ N (Tarpent 1987:637)
- c. Neediit mehlit.
nee=dii=t mehl-T-t
NEG=FOC=3.I tell-T-3.II
‘He didn’t tell it.’ G (VG)
- d. Mehldit loo’y.
mehl-T-ə-t loo-’y
tell-T-TR-3.II OBL-1.II
‘He told it to me.’ G (VG)

The surface form of the *-T* morpheme is further complicated when it follows a sonorant or vowel; we refer the reader to Tarpent (1987:634) for further details and reasoning regarding its appearance, but present a summary in the next section.

Under the understanding that this morpheme (*-T*) can sometimes be realized as a consonant and sometimes a vowel, we are able to better understand the inflectional pattern of stems like *mahl* ‘tell’, and maintain a consistent view of where the transitive vowel appears. These marked stems bear a suffix in their transitive form which is realized as [d] when followed by the vowel in Independent transitive clauses, and as a vowel otherwise. Also note that ‘regular’ verb stems can productively shift to having this pattern (i.e. they may also receive the *-T* suffix) when combined with certain preverbals such as *gun* ‘make (s.o.)’, which trigger T-style inflection.

¹² Note that this pattern occurs consistently with all Series II pronominal suffixes except *-diit*, which deletes all but the base verb stem, producing e.g. *mahldiit* in either clause type. The only exception is with vowel-final stems, which may be suffixed with *-tdiit*.

¹³ (Forbes 2019) was unable to replicate examples like (26b) in Gitksan, suggesting that there the morpheme and/or alternation may be eroding in intransitive contexts.

3.4 Contrastive and non-contrastive TR environments in IT

In this section we have reviewed prior arguments establishing the presence of an underlying vowel between the verb stem and agreement suffix/connective in transitive Independent clauses (and object extraction). We have presented detailed examples demonstrating that phonological and morphophonological conditions sometimes insert a similar vowel in Dependent clauses; the precise conditions are as follows:

- (27) a. An inter-consonantal T-morpheme is realized as a schwa
b. Insert schwa between a sibilant and *-si'm* '2PL.II'
c. Insert schwa into a word-final cluster ending in a sonorant, including clusters formed by the addition of agreement suffixes *-y* '1SG', *-m* '1PL', *-n* '2SG'

We predict that any occurrences of a stem vowel in an intransitive or Dependent clause can be attributed to one or more of these factors. Changing the stem from a T-verb to a regular verb, or changing agreement to third-person agreement, should result in the vowel disappearing.

The transitive vowel is also deleted in expected Independent-clause and object-extraction in accordance with the following conditions:

- (28) a. Delete schwa before *-diit* '3PL.II'
b. Delete schwa after a sonorant-final unstressed syllable

We predict that any non-occurrence of the transitive vowel in Independent clauses or object extraction can be attributed to one of these factors. It is simply not visible after the causative *-in*, and changing agreement from third-plural *-diit* to any other suffix should allow the underlying vowel to reappear.

There are certain interactions with vowel-final stems that present more consistent surface contrasts between Independent and Dependent. This is either due to the need for hiatus resolution in Independent clauses, or due to a contrast in the realization of the 'big T' morpheme, if one is present alongside the transitive vowel. The following rules summarize these interactions:

- (29) a. Insert a glide /y/ between a stem-final vowel and transitive schwa
b. Realize big T in the coda of a CV stem before transitive schwa, no matter what the shape of the agreement suffix

The total space of possible stem shapes and suffix combinations is illustrated in Table 2; shaded cells mark those conditions where the particular stem/suffix combination has no surface contrast between Independent and Dependent clauses. In short, the phonological form of the stem, along with the form of the following agreement and/or connective, interact in complex but ultimately predictable ways, reflecting the underlying contrast between clause types in only a subset of situations.

4 Distribution of TR in CT

Transitive predicates in CT also often appear with a vocalic suffix in Independent clauses (30a) that is absent in Dependent clauses (30b):

Table 2: Combinations of stems and affixes in IT across clause type

	Obstruent		-si'm		Sonorant		-diit	
	I	D	I	D	I	D	I	D
<i>Obstruent</i>	gubit	gupt	gubisi'm	gupsi'm	gubin		gupdiit	
<i>Sibilant</i>	t'isit	t'ist	t'isisi'm		t'isin		t'isdiit	
<i>Sonorant (stressed syl)</i>	ginit	gint	ginisi'm	ginsi'm	ginin		gindiit	
<i>Sonorant (unstressed syl)</i>		kw'oodint	kw'oodinsi'm		kw'oodinin		kw'oodindiit	
<i>Vowel</i>	hlimooyit	hlimoot	hlimooyisi'm	hlimoosi'm	hlimooyin	hlimoon	hlimoodiit	
<i>Obstruent + T</i>	jakw diit	jagwit	jakw di si'm	jagwisi'm	jakw di n		jakw di it	
<i>Sonorant + T</i>		wandit	wandisi'm		wandin		wandiit	
<i>Vowel + T</i>	siwat diit	siwadit	siwat di si'm	siwadisi'm	siwat di n	siwadin	siwat di it	siwadiit

- (30) a. **Gabit.**
 gap-ə-t
 eat-TR-3.II
 ‘He/she ate it.’ (*Independent*)
- b. Akadit **gapt.**
 aka=di=t gap-t
 NEG=FOC=3.I eat-3.II
 ‘He/she didn’t eat it.’ (*Dependent*) CT (VN)

The same vowel also appears in object extraction constructions, and is absent in agent extraction constructions:

- (31) a. ts’ik’aawsa **gabit**
 ts’ik’aaws=a gap-ə-t
 split.salmon=CN eat-TR-3
 ‘the split salmon s/he ate’ (*O-extr*)
- b. gyeda int **gapt**
 gyet=a in=t gap-t
 person=CN AX=3.I eat-TR-3
 ‘the person who ate it’ (*A-extr*) CT (VN)

These two syntactic environments are precisely where the transitive vowel is found in IT. In this section we extend the discussion in Section 3 to CT and show that the IT and CT vowels should be analyzed as direct cognates. We show that the distribution of this suffix in CT is identical to its presumed IT cognate: it appears in transitive Independent clauses, object extraction, and nowhere else.

As in IT, the distribution of the vowel suffix is obscured by a number of morphophonological processes which may result in the vowel being deleted where it is expected to appear, or an identical epenthetic vowel appearing where it is not expected to appear. This opaque surface distribution led Sasama (2001) to characterize what we call the transitive vowel as multiple separate phenomena, including a ‘bi-argumental’ or transitive suffix when it surfaces as a glide [-y] after vowel-final stems, or as an epenthetic or ‘inserted’ vowel when it surfaces as a vowel elsewhere. Building on discussion in Forbes (2018), we provide a clear description of where the transitive vowel is licensed in CT, and the phonological processes which condition its appearance.

A note on orthography: the CT orthography represents a sequence of an underspecified vowel and a sonorant with a single letter representing the sonorant. For example, the Gitksan aspectual morpheme *dim* /dəm/ has a cognate *dm* /dəm/ in CT, which has an identical pronunciation. In order to adequately show the distribution of the transitive vowel, as well as discuss epenthesis processes, we have strayed slightly from the CT community orthography by overtly writing a vowel in the environment under discussion.

4.1 Epenthesis conditions (CT)

As observed in Section 3.1 for IT, sometimes Independent and Dependent verbal forms both contain a vowel. Just as in IT, we attribute this to vowel epenthesis processes which occur in Dependent

clauses, producing a surface form similar to where the transitive vowel is underlying. We show that the contexts under which these epenthesis processes occur are completely predictable and closely correspond to what is observed in IT, and therefore that they can be safely factored out of our understanding of the transitive vowel's distribution.

The epenthesis of an underspecified vowel, represented with a schwa, between a verb stem and an agreement suffix occurs in cases where the verb stem ends in a consonant (C) and the agreement suffix begins with a sonorant (R). The agreement suffixes which trigger this epenthesis are second-person singular (2SG: *-n*), first-person plural (1PL: *-m*), as well as all of the first and second-person suffixal pronouns (1SG *'nu*, 2SG *n*, 1PL *'nm*, and 2PL *nsm*). This epenthesis can be observed with an obstruent-final stem in (32a) and (32b) and a sonorant-final stem in (33a) and (33b) where we see identical verb forms across both Independent and Dependent clauses, despite the proposed underlying presence of the transitive vowel in (32a) and (33a) and its absence in (32b) and (33b).

(32) Obstruent-final stem + sonorant-initial suffix:

a. **Gabin.**

gap-ə-n

eat-TR-2.II

'You ate it.' (*Independent*)

b. Akadit **gabin.**

aka=di=t gap-n

NEG=FOC=3.I eat-3.II

'It didn't eat you.' (*Dependent*)

CT (VN)

(33) Sonorant-final stem + sonorant-initial suffix:

a. **Limoomin.**

limoom-ə-n

help-TR-2.II

'You helped him.' (*Independent*)

b. Akadit **limoomin.**

aka=di=t limoom-n

NEG=FOC=3.I help-3.II

'He didn't help you.' (*Dependent*)

CT (VN)

The inter-sonorant environment for epenthesis is not active in cases where a sonorant-initial agreement suffix follows a vowel-final verb stem. Sequences of /V-ə-R/ trigger an epenthetic glide which appears between the verb stem and the transitive vowel, resulting in the surface form of [V-yə-R]. This process is identical to the glide formation process discussed in IT. Here we can see a contrast between Independent and Dependent clauses: Independent clauses with vowel-final verb stems clearly show the presence of the transitive vowel, which is absent in Dependent clauses:

(34) Vowel-final stem + sonorant-initial suffix:

a. **'Nax'nuuyin.**

'nax'nuu-ə-n

hear-TR-2.II

'You heard it.' (*Independent*)

- b. Akadit **'nax'nuun.**
 aka=di=t 'nax'nuu-n
 NEG=FOC=3.I hear-2.II
 'He/she didn't hear you.' (*Dependent*) CT (VN)

Another environment which triggers the epenthesis of vowel of identical quality to the transitive suffix occurs when a sibilant (S) final stem is followed by the a sibilant-initial suffix *-sm* '2PL':

- (35) Sibilant-final stem + suffix *-sm*:
- a. **T'uusismt** Henry.
 t'uus-ə(-t)-sm=t Henry
 hit-TR-2PL.II=PN Henry
 'You all hit Henry.' (*Independent*) CT (VN)
- b. Akadit **t'uusism.**
 aka=di=t t'uus-sm
 NEG=FOC=3.I hit-2PL.II
 'He/she didn't hit you all.' (*Dependent*) CT (VN)

This sibilant epenthesis rule does not apply with the proper-noun connective *=s*. Here we see a contrastive environment: the sequence of sibilant-final stem, transitive vowel, and a proper-noun clitic *=s* will surface as [sis], while a sibilant-final stem followed immediately by *=s* surfaces as [s]:

- (36) Sibilant-final stem + connective *=s*:
- a. **T'uusis** Henryt Aidan.
 t'uus-ə(-t)=s Henry=t Aidan
 hit-TR-3.II Henry=PN Aidan
 'Henry hit Aidan.' (*Independent*)
- b. Akadit **t'uus** Henry.
 aka=di=t t'uus(-t)=s Henry
 NEG=FOC=3.I hit-3.II Henry
 'He/she didn't hit Henry.' (*Dependent*) CT (VN)

A final environment for vowel epenthesis is when a cluster consisting of an obstruent-stop sequence in a verb's coda position is followed by an obstruent suffix such as *-t* '3.II' or *=s* 'PN'. This is observed in (37) where we see an epenthetic vowel separating the stem and the person agreement in the *Dependent* order:

- (37) a. Stop-final cluster followed by third-person *-t*:
- Daaltgis** Henry hana'a.
 daaltk-ə(-t)=s Henry=a hana'a
 meet-TR-3.II=PN Henry=CN woman
 'Henry met the woman.' (*Independent*)
- b. Akadit **daaltgit.**
 aka=di=t daaltk-t
 NEG=FOC=3.I meet-3.II
 'He didn't meet her.' (*Dependent*) CT (VN)

This epenthetic environment is restricted to stop-final complex codas as in (37) and does not occur with other types of complex coda such as the fricative-final cluster in (38).

- (38) a. **Ludamksida** mak'ooxs.
 lu=damks-ə-t=a mak'ooxs
 in=squeeze-TR-3.II=CN salmonberries
 'S/he squeezed the salmonberries.' (*Independent*)
- b. Akadit **ludamkst.**
 aka=di=t lu=damks-t
 NEG=FOC=3.I in=squeeze-3.II
 'S/he didn't squeeze them.' (*Dependent*) CT (VN)

Given that transitive verbs with this shape of coda are quite rare in Sm'algyax, vowel epenthesis which results in a neutralizing of contrasts between the Independent and Dependent clause types occurs less frequently in this type of environment than the other two environments discussed in this section.

In sum, three morphophonological environments for vowel epenthesis, all of which occur between the verb stem and suffixal agreement in CT, trigger identical surface forms for verbs in the Independent and Dependent orders, thus neutralizing surface contrasts between the two. Two of these conditions are identical to those discussed in IT in Section 3.1: sonorant-suffix conditioned epenthesis and epenthesis triggered by an S-initial suffix appearing after an S-final stem. The third condition appears to be unique to CT, and occurs when a stop-final complex coda is followed by an obstruent suffix/clitic. Let us now turn to deletion processes, which also obscure the distribution of the transitive vowel.

4.2 Deletion conditions (CT)

In contrast to the identical epenthesis processes and environments that occur in both branches of the family discussed in Sections 3.1 and 4.1, the deletion processes and environments in CT are simpler, and apply more broadly than those in IT. Consequently, more often than not a proposed underlying transitive vowel will not actually surface in CT. There are two deletion environments that result in the underlying transitive vowel not surfacing in the Independent order in CT, yielding identical surface verb forms across both clause types.

The first environment that triggers the deletion of an expected transitive vowel occurs when a verb stem has a sonorant coda. Unlike the sonorant conditioned deletion discussed in Section 3.2 for IT, this deletion environment is not sensitive to stress in CT, and is categorical. Any sequence of sonorant-final verb and a transitive vowel will result in the deletion of the vowel: /R-ə/ becomes [R]. This can be observed below with the sonorant-final verb *limoom* 'to help'. Despite the proposed underlying difference between the Independent and Dependent verbal complex, the verbs in (39a) and (39b) share an identical surface form due to this process of vowel deletion after a sonorant:

- (39) Sonorant-final stem:
- a. Dm **limoomt.**
 dm limoom-ə-t
 PROSP help-TR-3.II
 'S/he will help him/her.' (*Independent*)

(43) TR deletion before first-person suffix *-u*:

- a. **Gabu** sami.
 gap-ə-u=a sami
 eat-TR-1SG.II=CN meat
 ‘I ate meat.’ (*Independent*)
- b. Akadit **gabu**.
 aka=di=t gap-u
 NEG=FOC=3.I eat-1SG.II
 ‘It didn’t eat me.’ (*Dependent*)

CT (VN)

This deletion process is also observed in (44) where we see an Independent clause with a common-noun connective *=a* following the transitive vowel, and the transitive vowel does not surface, resulting in identical surface forms of the verb:

(44) TR deletion before connective *=a*:

- a. **Gaba** gyeda ts’ik’aaws.
 gap(-ə-t)=a gyet=a ts’ik’aaws
 eat-TR-3=CN person=CN split.salmon
 ‘The people eat split dried salmon.’ (*Independent*)
- b. Yagwat **gaba** ts’ik’aaws.
 yagwa=t gap(-ə-t)=a ts’ik’aaws
 PROG eat-TR-3=CN split.salmon
 ‘S/he is eating split dried salmon.’ (*Independent*)

CT (VN)

Having outlined the epenthesis and deletion environments which obscure the presence of an underlying transitive vowel in CT, we will turn to the interaction between the transitive vowel and ‘big T’.

4.3 Morphological interaction between TR and big T (CT)

As in IT, CT also has a special class of verbs which inflect with the abstract suffix *-T*, resulting in the appearance of a [-t]/[-d] suffix in Independent clauses and a vowel in Dependent clauses.¹⁵ This is observed in (45) where we see that a ‘T-verb’ such as *mał* ‘tell’ inflects differently from an ordinary verb such as *gap* ‘eat’ in (46):

- (45) a. Dm mał**dit** da k’wan.
 dm mał-T-ə-t da=a kw’an
 PROSP tell-T-TR-3.II PREP=CN 2SG.OBL
 ‘S/he will tell it to you.’ (*Independent*)
- b. Yagwat mał**it** da k’wan.
 yagwa=t mał-T-t da=a kw’an
 PROG=3.I tell-T-3.II PREP 2SG.OBL
 ‘S/he is telling it to you.’ (*Dependent*)

CT (VN, BR, EM)

¹⁵ This *-T* suffix in CT is briefly described in Sasama (2001:140) where it is referred to as a ‘bi-argumental’ marker. Sasama does not address the variable surface form of this suffix.

- (46) a. Nah gabida hoon.
 nah gap-ə-t=a hoon
 PFV eat-TR-3.II=CN fish
 ‘S/he ate fish.’ (*Independent*)
- b. Akadit gapt.
 aka=di=t gap-t
 NEG=FOC=3.I eat-3.II
 ‘S/he didn’t eat it.’ (*Dependent*)
- CT (VN, BR, EM)

Other common T-verbs are *sityaaw* ‘change’, *aa’pax* ‘remember’, *gwelk* ‘burn’, *gats* ‘pour’, and *gaa* ‘take’. Furthermore, as in Gitksan and Nisga’a, certain grammatical processes can switch the inflectional class of a verb to that of a T-verb. For instance, a transitive predicate preceded by the causative *gun* will inflect with T:

- (47) *Gun* causes T-inflection:
- a. Gun gap**di**da ’yens a ɫguwoomɫk.
 gun gap-T-ə-t=a ’yens a=a ɫguwoomɫk
 CAUS eat-T-ə-3.II=CN leaf PREP=CN child
 ‘S/he made the child eat greens.’ (*Independent*)
- b. Akadit gun gab**i**ɫ ’yens a ɫguwoomɫk.
 aka=di=t gun gap-T(-t)=ɫ ’yens a=a ɫguwoomɫk
 NEG=FOC=Third.I CAUS eat-T-3.II=CN leaf PREP=CN child
 ‘S/he didn’t make the child eat greens.’ (*Dependent*)
- CT (VN)

Understanding the distribution of this -T suffix is important as up until this point we have predicted that, barring those cases exhibiting epenthesis, Dependent clauses should *not* have a vowel in this position in the verbal complex. As the above examples show, the basic distribution of -T in CT mirrors that of -T in IT: in Independent clauses -T appears before the transitive vowel, surfacing as [di] (or [ti] when following a sonorant-final stem (see Sasama 2001:140)), while in Dependent clauses there is no transitive vowel, but the -T suffix may surface as a vowel which is phonetically identical to the transitive vowel, but crucially differs with respect to its syntactic distribution. Apparent instances of a transitive vowel appearing in a Dependent clause can be either reduced to the epenthesis described in Section 4.1 or can be analyzed as the vocalic surface form of -T. A deeper look at the similarities and differences between this -T suffix across Tsimshianic is left as important future work.

4.4 Contrastive and non-contrastive TR environments in CT

Following the argumentation and discussion in Section 3 we have shown that the transitive vowel in IT has a direct cognate in CT. This suffix, as in IT, appears in a verb-stem-adjacent position in clauses of the Independent order, including object-fronting constructions. This otherwise clear distribution is obscured by a number of phonological and morphological processes which either result in the deletion of the suffix in Independent clauses, or the epenthesis of an identical vowel in Dependent clauses. The processes which result in a (non-transitive) vowel appearing in this stem-adjacent position are as follows:

- (48) a. An inter-consonantal T-morpheme is realized as a schwa
 b. Insert schwa between a sibilant and *-sm* ‘2PL.II’
 c. Insert schwa into a word-final cluster ending in a sonorant, including clusters formed by the addition of agreement suffixes *-n* ‘2SG.II’, *-m* ‘1PL.II’ and the reduced pronouns *'nu* ‘1SG’, *n* ‘2SG’, *nm* ‘1PL’, *nsm* ‘2PL’
 d. Insert schwa between an obstruent-stop cluster and a stop

The absence of an expected transitive vowel in an Independent clause can be attributed to the following deletion conditions:

- (49) a. Delete schwa after a sonorant
 b. Delete schwa before a vowel

Table 3 illustrates the possible combinations of stems and suffixes across both clause types. Shaded cells mark conditions where there is no contract between Independent and Dependent clauses.¹⁶

5 Pinning down the transitive vowel environment: Splits in CT person-marking

CT notably demonstrates several distinct types of transitive agreement in Independent clauses, further influencing the distribution of the transitive vowel. Independent clauses in CT in which the object is third person contrast with Independent clauses where the object is a participant (first or second-person) (see Forbes 2018 for more in-depth discussion). We refer to the third-person object pattern, illustrated in (50a), as the UNMARKED pattern, as these clauses are the most frequent and are the only type seen in IT. The participant-object patterns are MARKED, and there are two of them: those with participant subjects (1/2-on-1/2, shown in (50b)) and those with third-person subjects (3-on-1/2 as in (50c)).

- (50) a. Unmarked: Third-person object:
 Nah t'uusismt 'niit.
 nah t'uus-ə-sm=t 'niit
 PFV hit-TR-2PL.II=PN 3.III
 ‘You all hit him.’
- b. Marked: 1/2-on-1/2:
 Nam t'uusu.
 nah=m t'uus-u
 PFV=2.I push-1.II
 ‘You hit me.’

¹⁶ This table does not reflect potential variability in the shape of the -T suffix in Dependent clauses. While, for instance, -T often surfaces as [t] or [d] before an epenthetic vowel triggered by a sonorant, as in Dependent *dzakwdin*, an attested variant of this is *dzagwin*, with the -T suffix appearing in its vowel form. Exploring this variability, and providing a detailed description and analysis of big T in CT is left as important future work.

Table 3: Combinations of stems and affixes in CT across clause type

	Obstruent		-sm		Sonorant		Vowel	
	I	D	I	D	I	D	I	D
<i>Obstruent</i>	gab it	gapt	gabism	gapsm	gabin		gab <u>u</u>	
<i>Obs-Stop</i>	daaltg it		daaltgism		daaltgin		daaltg <u>u</u>	
<i>S-final</i>	t'uust	t'uust	t'uusism		t'uusin		t'uusu	
<i>Obs-Stop</i>	daaltg it		daaltgism		daaltgin		daaltg <u>u</u>	
<i>Sonorant</i>	limoomb	limoomb	limoomism		limoomin		limoomu	
<i>Vowel</i>	'nax'nuuy it	'nax'nuut	'nax'nuuyism	'nax'nuusm	'nax'nuuyin	'nax'nuun	'nax'nuuyu	
<i>Obstruent + T</i>	dzakw dit	dzagwit	dzakw dit ism	dzagwism	dzakwdin		dzakwdu	
<i>Sonorant + T</i>	güül tit	güült	güül tit ism	güülism	güültin		güültu	
<i>Vowel + T</i>	ga adit	gaat	ga adit ism	gaadism	gaadh		gaadu	

- c. Marked: 3-on-1/2:
 Naht t'uusinsm.
 nah=t t'uus-nsm
 PFV=3.I hit-TR-2PL.III
 'He hit you all.'

CT (VN, BR, EM)

In the unmarked (50a) we see a second-person agent and a third-person object. The agent is marked by a series II verbal suffix, which is consistent with transitive Independent clauses across Tsimshianic. In the marked 1/2-on-1/2 sentence in (50b) the agent is marked with a pre-predicative series I clitic, while the object is marked with the series II suffix, as is usually the case in Dependent clauses. In the marked 3-on-1/2 sentence in (50c) the agent is marked by a pre-predicative series I clitic, while the object is marked by a series III suffixal pronoun. This $A_I O_{III}$ pattern is distinct from both canonical Independent marking ($A_{II} O_{III}$) and Dependent marking ($A_I O_{II}$).¹⁷

IT exhibits neither of the marked patterns in Independent clauses. We therefore have no comparative basis on which to predict whether or not the transitive vowel should appear in the marked-agreement clauses. We might entertain two opposing hypotheses:

- (51) a. **Conditioned by clause type:** The transitive vowel is present in all transitive Independent clauses, regardless of what person markers are used.
 b. **Conditioned by agreement:** The transitive vowel is present only in the unmarked condition where the series II suffix marks an agent. (Tarpent 1987)

The sonorant-initial nature of most participant-referring person markers used in these contexts means it is usually difficult to tell whether or not the transitive vowel is present in these clauses; vowel epenthesis as discussed in Section 4.1 means these contexts are typically non-contrastive. However, we can rely on the similarly predictable process of glide epenthesis to detect the transitive vowel after a vowel-final verb, even when a sonorant is suffixed. The examples in (52) and (53) clearly

¹⁷ There are occasional deviations from this pattern noted in the literature; for instance, the following 1/2-on-1/2 example in (i) uses the expected 3-on-1/2 marking:

- (i) M 'waayi'nu.
 m= 'waa-'nu
 2SG.II= find-1SG.III
 'You found me.'

CT Boas (1911:385), cited in Mulder (1989) (glosses our own)

The unmarked person-marking configuration is also broadly acceptable in Independent clauses even when the object is not third-person. This is exemplified in the two acceptable sentences below, one exhibiting the marked 1/2-on-1/2 pattern $A_I O_{II}$, the other the unmarked pattern $A_{II} O_{III}$:

- (ii) a. Nt'oyaxsn.
 n=t'oyaxs-n
 1SG.I=thank-2SG.II
 'I thank you.'
 b. T'oyaxsut 'nüün.
 t'oyaxs-u=t 'nüün
 thank-1SG.II=PN 2SG.III
 'I thank you.'

CT (VN)

demonstrate that while the transitive vowel appears as predicted in the Unmarked sentences (a), it appears in neither of the Marked ones (b,c):

- (52) a. Unmarked: Third-person object:
 'Nax'nuuyinit Tiffany?
 'nax'nuu-ə-n=i=t Tiffany
 hear-TR-2SG.II=Q=DM Tiffany
 'Did you hear Tiffany?' (Sasama 2001)
- b. Marked: 1/2-on-1/2:
 Nan **'nax'nuuni?**
 nah=n 'nax'nuu-n=i
 PFV=1.I hear-2.II=Q
 'Did I hear you?' (VN)
- c. Marked: 3-on-1/2:
 'Nax'nuunit Tiffany?
 'nax'nuu-n=i=t Tiffany
 hear-2SG.III=Q=DM Tiffany
 'Did Tiffany hear you?' *CT* (Sasama 2001)
- (53) a. Unmarked: Third-person object:
 T'aayint Kayla.
 t'aa-ə-n=t Kayla
 hit-TR-2SG.II=PN Kayla
 'You slapped Kayla.' (Sasama 2001)
- b. Marked: 1/2-on-1/2:
 Nan **t'aan.**
 Nah=n t'aa-n
 PFV=1.I slap-2.II
 'I slapped you.' (VN)
- c. Marked: 3-on-1/2:
 T'aant Kayla.
 t'aa-n=t Kayla
 hit-2SG.III=DM Kayla
 'Kayla slapped you.' *CT* (Sasama 2001)

The predictable phonological processes we have pinned down for CT therefore provide us with clear confirmation of the second hypothesis: the transitive vowel is not conditioned by the clause type specifically, but rather by the function of agreement. If the verb has a Series II suffix referencing an ergative agent, it also has an underlying transitive vowel (a generalization originally presented by Tarpent 1987 for Nisga'a.) Because the transitive vowel is conditioned only by an ergative Series II suffix, it categorically fails to appear alongside the other option for ergative agreement, the Series I clitics. The proper conditions for its appearance occur in unmarked Independent clauses as well as object extraction, but not marked Independent clauses, Dependent clauses, or any other types of extraction.

6 Conclusion and final comparisons

In Sections 3 and 4 we have demonstrated a predictable difference in the shapes of Independent versus Dependent transitive verb stems, in both Interior Tsimshianic (Gitksan) and Maritime Tsimshianic (Coast Tsimshian). In both cases, the difference is broadly in the presence or absence of what we refer to as the transitive vowel. Though there are subtle factors obscuring its appearance in both branches, we can clearly conclude that the transitive vowel is part of the underlying representation of verb stems where the Series II suffixes (e.g. *-y/-u, -n, -t*) are exclusively responsible for ergative agreement, as in (54) (repeated from (9)).

- (54) **Transitive vowel generalization:** An underlying vowel is present on transitive verb stems in the Independent order and in object extraction, immediately preceding a Series II agreement suffix referencing the ergative subject.

Here we briefly summarize the similarities and differences in how this cross-Tsimshianic generalization surfaces in each branch, before concluding.

The majority of the differences in transitive-vowel realization between the two branches follow from branch-particular phonological conditions. In particular, CT has a strict rule of vowel deletion after a sonorant, which affects not only the transitive vowel but also the vocalic connective *=a*. In the Interior, deletion of a vowel after a sonorant is only obligatory when the sonorant is the coda of an unstressed syllable — a condition largely (but not exclusively) restricted to contexts with the causative suffix *-(d)in* (Hunt 1993). In addition, the transitive vowel in CT is deleted when followed by either of the two vocalic elements *-u* ‘1SG.II’ or *=a* ‘CN’. In IT, the cognate morphemes are not vocalic, and there are no other candidate vowel-initial morphemes that would attach in the relevant position to delete the transitive vowel.

Save for vowel epenthesis in stop-final clusters that is restricted to CT, all other phonological processes that occur in the relevant environment — vowel epenthesis into a sonorant-final consonant cluster, vowel epenthesis between adjacent sibilants in the verb stem and agreement, and glide epenthesis between a stem-final vowel and the transitive vowel — are identical between the branches.¹⁸ In both branches, the difference between Independent and Dependent inflection is most clear when the stem ends in an obstruent and the following agreement or connective is third-person *-t* or the connective *=s*, where none of these processes apply.

The transitive vowel’s interactions with other morphemes vary only minimally across the two Tsimshianic branches. The Interior branch alone has a third-person plural suffix *-diit*, which always deletes the preceding transitive vowel; the Maritime branch has no such suffix and therefore has no environment for morphologically-conditioned deletion. The abstract morpheme *-T* can be identified in both branches, appearing on cognate verbs, and demonstrates near-identical behavior of realization as either a consonant */t/* or a schwa. Explanations of its behavior in IT such as Tarpent (1987), while complex, can be used with few modifications in analysis of CT. Vowels between a verb stem and its agreement suffixes can always be attributed to either this morpheme *-T*, the transitive vowel, or predictable phonologically-conditioned epenthesis.

¹⁸ The latter in particular distinguishes the behavior of the transitive vowel *-(y)i*, which resolves vowel hiatus with insertion of a glide, from that of the intransitive subject extraction morpheme *-(i)t*, which resolves hiatus via deletion. We have no ready explanation of this difference in behavior other to say that morphological factors must be at play somehow; but it is notable that the branches have identical behavior with respect to these cognates, among their other similarities.

Finally, there are differences in Independent clause agreement in IT versus CT. Not all CT Independent clauses have an ergative Series II suffix. We demonstrate in Section 5 that only when the suffix is ergative — contexts with a third-person object — does the transitive vowel appear on the verb stem. This contrasts with IT Independent clauses, where the Series II suffix is always ergative and the transitive vowel always appears. Ergative Series II agreement is also a feature of clauses from which an object has extracted. There is consequently an absolute correspondence between the ergative behavior of the Series II suffix and the underlying presence of the transitive vowel (see Forbes 2018 for further discussion).

In both branches, the restriction of the transitive vowel to specific clause-level contexts (Independent clauses and object extraction clauses, which have the proper agreement properties) distinguish it from explicit transitivizers and bi-argumental morphology which surface freely in both clause types. This includes morphemes like the abstract -T morpheme and causatives like *-(d)in/-'in*.

We conclude by reiterating that recognition of the transitive vowel in both branches of the Tsimshianic family is a crucial part of understanding their inflectional morphology. We hope that the phonological, morphological, and syntactic rules we have discussed can be of use to future cross-Tsimshianic work, and in particular to analytical and pedagogical work on Maritime Tsimshianic, where the presence of the transitive vowel has not previously been recognized.

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