Morphology in the 'Wrong' Place:
The Curious Case of Coast Tsimshian Connectives

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1 Introduction

Morphology signaling a dependent's relationship to its head—and not a head's relationship to its dependent—is usually realized either on the head of or at some edge of that dependent. However, in the Native American language Coast Tsimshian (Tsimshianic; British Columbia), such morphology is unusually realized: particular formatives—'connectives'—grammatically relate to the following expression but attach to the preceding word, as exemplified in (1), where the second line shows the relevant functional groupings:

(1)   Yagwat   huumda   duusa   hoon.
        Yagwa-t   huum-[da   duus]-[a   hoon]
        CONT-3.A smell-[ERG.CN cat]-[ABS.CN fish]
        'The cat is sniffing the fish.'   (Mulder 1994, 32)

In (1), the connective *-da* signals the case of the following nominal expression (*duus*), even though it is attached the preceding word, the content verb of the clause (*huum*). Similarly, *-a* signals the case of *hoon* even though it is attached to *duus*. This behavior is not merely a quirk of Coast Tsimshian: similar behavior is found throughout the (small) Tsimishianic family as well as geographically adjacent northern Wakashan languages (such as Kwakwala, see Anderson 1984), suggesting that this is a possible realization strategy within the world's languages.

    As I will argue in section 2, there is good evidence for considering these formatives affixes on the preceding word, so this phenomenon also poses a challenge to theories of the morphology-syntax interface, as these theories are generally designed to best deal with the more common instance of constituent-internal realization of relevant features. Yet, in spite of the seemingly weird location of the connectives, I propose that the Coast Tsimshian pattern can be straightforwardly analyzed in HPSG using EDGE features that are additionally sensitive to an immediate precedence linear order constraint, offering a straightforward account of the phonology, morphology, and syntax of these formatives and the words they appear with.

2 More on the 'Connectives'

Stepping back for a second, let me consider several alternative views of the connectives in Coast Tsimshian. One possibly is that they are misanalyzed canonical head-marking. The fact that the absolutive connective *-a* in (1) appears on what is clearly not the head of the clause (the noun *duus*) suggests that there is no misanalysis. Putting this view to rest, Coast Tsimshian independently exhibits head-marking pronominal affixes/clitics — which appear on either the initial word or the content verb itself — bolded in (2):

(2)   Wayi, ła-**t**   'nisg<u>a</u>tg-**it**   *gad*-a   awta-t   'niit-ga.
        well   PST-3.A make.fun.of-3.O reported-ERG.CN porcupine-ABS.CN 3SG-DEM
        'It is said that porcupine made fun of him.'   (Mulder 1994, 175)

As (2) also shows, there is no requirement that the connective related to the linearly first NP be attached to the verb. In (2), the ergative connective appears on *gad-*, the postverbal particle indicating reported speech. This datum suggests that any connective must appear on whatever is just before the expression that the connective 'connects' with. However, the connective need not appear immediately adjacent to the head noun that it is related to. In (3), the connective *-asga* and the head noun *yetsisk* are separated by two adjectives:

(3)   'Yaḡay 'wii gyisiyaasg-at in-t   deentg-**asga**   łgu alasg-m   **yetsisk**.
        instead great northwind-3 TOP-3 avenge-ABS.CN little weak-ADJ.CN land.animal
        'Instead, it was the great northwind that avenged the little weak animal.'   (Mulder 1994, 35)

Thus, it appears that the connective must, in fact, appear before the *noun phrase* that it relates to.

Given the above facts, another possible analysis of the syntax of connectives is available (hinted at, but not fully developed, in Klavans 1985, 106–107 for Kwakwala). On this analysis, the usual verb-initial structure is licensed; one such possibility for (1) is given in (4):

(4)
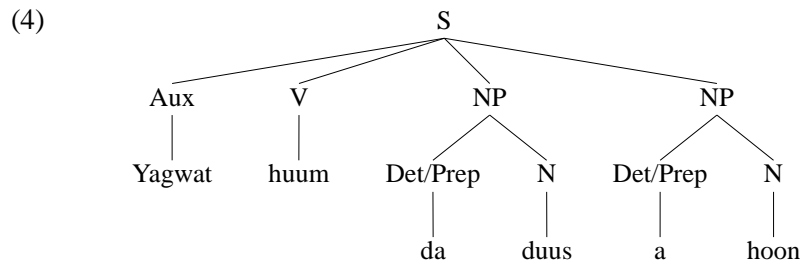
In addition to the structure in (4), the phrasal phonology imposes constraints that force the connectives to lean to their left, perhaps because they are 'weak' elements (this sort of analysis could be implemented in HPSG using Reape-style domains (Reape 1994)). On this analysis, then, the words would have a canonical syntax, but an unusual phonology. (A similar idea with different details is also proposed in Anderson 2005, ch. 2 & 3). Assuming the standard phrasal vs. lexical distinction in phonological rules (as Klavans (1985) does – see Kiparsky 1982 for some discussion of why the distinction should be made), this analysis predicts that only phrasal (postlexical) phonological processes should occur between stems and connectives. The Coast Tsimshian evidence suggests that this is false and, in fact, word-internal phonological behavior does occur between stems and connectives.

One relevant phonological process is what Stebbins (2003, 405–406) calls stem-final lenition. In this process, voiced stops appear instead of voiceless ones, when followed by a vowel. This process occurs when the conditioning environment is clearly an affix, such as the *-u* '1SG.ERG'. As (5) shows, the final /p/ within the verb 'eat' becomes [b] following *-u*:

(5)   /gɑ**p**-u/   → [gɑ**bu**]   (orthographic {g*a*b*u*})   (Stebbins 2003, 405)
        eat-1SG.ERG

This same process can occur with connectives. In (6), the stem final /k/ becomes [g] when followed by the connective *-a* [æ] 'ABS.CN':

(6)   /ʁɑ-nuːt**k**-æ/   → [ʁɑnuːt**g**æ]   (orthographic {*ganuutga*})   (Stebbins 2003, 405)
        PL-dress.up-ABS.CN

Furthermore, this process fails to apply across a word-boundary:

(7)   /... gaik-**t**   ædæ-t   ... / → [gaik**t**ædæt]   (Mulder 1994, 131)
        chest-3.POSS and-3.ERG

2

This pattern of phonological behavior points to the conclusion that stem-final lenition is, as its name suggests, a word-internal process. Because the phonology treats the connectives as part of the word and words (and not morphemes) are the atoms of syntax (see Bresnan and Mchombo 1995 for reasons to think that this provides for a more elegant treatment of the syntax), it follows that the stem + connective units are words and should be so treated by the syntax. In addition to stem-final lenition, analogous arguments for treating connectives as affixes can also be made from word-internal tonal patterns (Dunn 1979), vowel epenthesis (Stebbins 2003), and the deletion of the connective *-a* in certain word-internal phonological contexts (Mulder 1994, 24–25).

3   An EDGE-based Analysis

Taking this wordhood as a baseline, I outline an approach for analyzing these data. The evidence in the previous section is strongly reminiscent of the phenomenon known as edge-inflection (Zwicky 1987; Miller 1992; Tseng 2003, among others), where some affix (such as English *'s*) is obligatorily realized at the edge of a particular constituent. While I will utilize the machinery of an HPSG analysis of edge-inflection (as presented in Tseng 2003) in analyzing the connectives, something more needs to be said, because the connectives still appear on the 'wrong phrase'. (Notice that is the English *'s* is a part of the possessor phrase while the Coast Tsimshian connectives are not even within the noun phrase that functions in the ergative or absolutive role.) I further propose that these EDGE features are constrained by a linear precedence rule that requires the EDGE-marked word to immediately precede the phrase that it marks, making the Coast Tsimshian an instance where both dependency and linear order play a role in the licensing of case forms.

Let us first consider words with a connective. I assume that such words are produced via a lexical rule (or similar device) that yields the appropriate morphophonological form and a syntactic specification about the kind of connective that appears at their right edge (Because of space restrictions, I just focus on case here, though a full account will also need to account for the determiner-like restrictions the connectives have). The relevant feature path (following Tseng 2003) is then EDGE|RIGHT|CASE-MARKING (henceforth EDGE|R|C-M). So, a noun suffixed with an absolutive connective—like *duusa* 'cat.ABS.CN'—will have the key elements shown in its entry in (8):

$$
(8) \quad
\begin{bmatrix}
word \\
\text{FORM} \quad \langle\, duusa \,\rangle \\
\text{SYN} \quad
\begin{bmatrix}
\text{HEAD} & noun \\
\text{EDGE}\,|\,\text{R}\,|\,\text{C-M} & abs
\end{bmatrix}
\end{bmatrix}
$$

Lexical entries like (8) (and the phrases they project) will interact with the lexical entries of verbs to produce clauses. An example verb entry – of *huumda* 'smell.ERG.CN'–is given in (9):

$$
(9) \quad
\begin{bmatrix}
word \\
\text{FORM} \quad \langle\, huumda \,\rangle \\
\text{SYN} \quad
\begin{bmatrix}
\text{HEAD} & verb \\
\text{EDGE}\,|\,\text{R}\,|\,\text{C-M} & erg
\end{bmatrix} \\
\text{ARG-ST} \quad \langle\, \text{NP[HEAD}\,|\,\text{CASE } erg]_i,\ \text{NP[HEAD}\,|\,\text{CASE } abs]_j \,\rangle \\
\text{SEM} \quad smell'(e, i, j)
\end{bmatrix}
$$

Huumda, like *duusa*, has a right-edge connective; in this case, an ergative marker, so it will have a EDGE|R|C-M value of *erg*. And as a subcategorizing head, this verb also has items on its ARG-ST list: these are the

usual sort of nominal arguments of verbs. They are specified for case; however, these case features are encoded as HEAD features on the nouns in the verb's entry despite the fact that would appear to be the wrong place for them; I will discuss the interaction of these HEAD features and the case-marking EDGE features momentarily.

I assume that an entry like (9) will give rise to clauses (or a large portion of a clause) through the interaction of, first, its ARG-ST and VAL features via the Argument Realization Principle (see, e.g. Ginzburg and Sag 2000, 171) and, second, the resulting VAL list with the following general phrase structure schema (identical, or nearly so, to Schema 3 from Pollard and Sag 1994, *sai-ph* from Ginzburg and Sag 2000, and *aux-initial-cxt* from Sag to appear):

(10) $\quad \begin{bmatrix} \text{VAL} & \langle\ \rangle \end{bmatrix} \rightarrow \mathbf{H}\begin{bmatrix} \text{VAL} & \langle\ \boxed{1}, \boxed{2}, ..., \boxed{m}\ \rangle \end{bmatrix} \quad \boxed{1}, \boxed{2}, ..., \boxed{m}$

This schema will build the head-initial 'flat structures' needed to analyze verb-initial word order of Coast Tsimshian, as evidenced by the examples in (1)–(3).

Further constraining these structures will be the linear precedence constraint in (11):

(11) $\quad \begin{bmatrix} \text{EDGE} \mid \text{R} \mid \text{C-M} & \boxed{1} \end{bmatrix} \ll \begin{bmatrix} \text{HEAD} \mid \text{CASE} & \boxed{1} \\ \text{VAL} & \langle\ \rangle \end{bmatrix}$

This constraint requires any connective-marked word to immediately precede the phrase with which is shares its case value. This, in effect, says that the 'wrong' placement of the connectives is licensed linearly, not just though a dependency relationship. Underspecifying the part of speech category of the first element in (11) allows for a connective to be realized on an (appropriately located) adverb in addition to a verb or a noun, as in (12):

(12) Wayi, ła-t 'nisg<u>a</u>tg-it **gad-a** awta-t 'niit-ga.
well PST-3.A make.fun.of-3.O reported-ERG.CN porcupine-ABS.CN 3SG-DEM
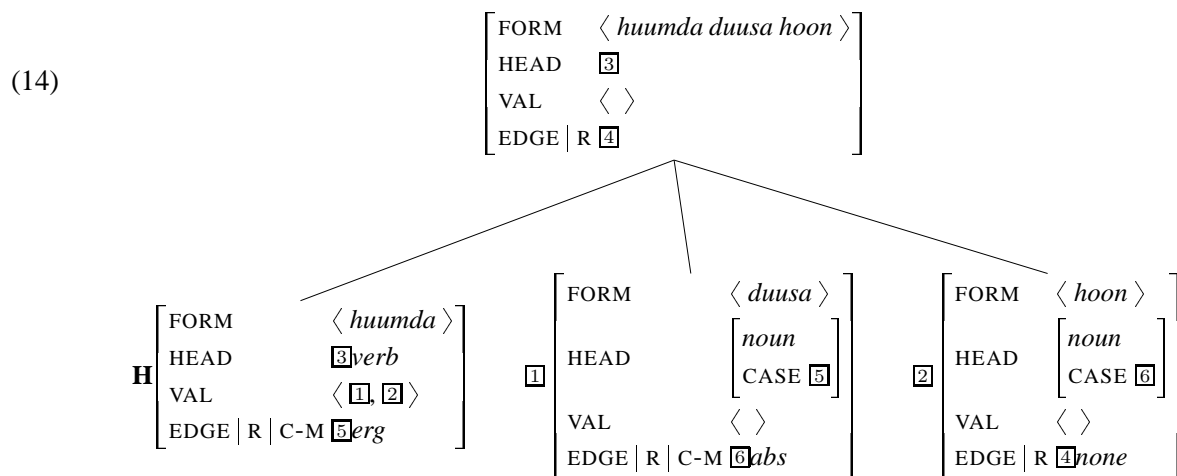'It is said that porcupine made fun of him.' (repeats (2))

Furthermore, the requirement in (11) that the second element be a saturated phrase straightforwardly predicts that the connective and its related noun need not be strictly linearly adjacent, as is found in (13):

(13) 'Yag<u>a</u>y 'wii gyisiyaasg-at in-t deentg-**asga** łgu alasg-m **yetsisk**.
instead great northwind-3 TOP-3 avenge-ABS.CON little weak-ADJ.CN land.animal
'Instead, it was the great northwind that avenged the little weak animal.' (repeats (3))

To see how the various constraints interact in a single example, let us consider (14), a tree of the relevant part of (1):

(14) $\quad \begin{bmatrix} \text{FORM} & \langle\ huumda\ duusa\ hoon\ \rangle \\ \text{HEAD} & \boxed{3} \\ \text{VAL} & \langle\ \rangle \\ \text{EDGE} \mid \text{R}\ \boxed{4} \end{bmatrix}$

$\mathbf{H}\begin{bmatrix} \text{FORM} & \langle\ huumda\ \rangle \\ \text{HEAD} & \boxed{3}verb \\ \text{VAL} & \langle\ \boxed{1}, \boxed{2}\ \rangle \\ \text{EDGE} \mid \text{R} \mid \text{C-M}\ \boxed{5}erg \end{bmatrix}$ $\boxed{1}\begin{bmatrix} \text{FORM} & \langle\ duusa\ \rangle \\ \text{HEAD} & \begin{bmatrix} noun \\ \text{CASE}\ \boxed{5} \end{bmatrix} \\ \text{VAL} & \langle\ \rangle \\ \text{EDGE} \mid \text{R} \mid \text{C-M}\ \boxed{6}abs \end{bmatrix}$ $\boxed{2}\begin{bmatrix} \text{FORM} & \langle\ hoon\ \rangle \\ \text{HEAD} & \begin{bmatrix} noun \\ \text{CASE}\ \boxed{6} \end{bmatrix} \\ \text{VAL} & \langle\ \rangle \\ \text{EDGE} \mid \text{R}\ \boxed{4}none \end{bmatrix}$

4

The structure in (14) satisfies the constraints on valence given in (10) as well as the (assumed) constraints imposed (10) as a headed phrase. The mother in (14) has the same EDGE|R value as its rightmost daughter, so it satisfies the Edge Feature Principle (Tseng 2003, 327). (Each daughter in (14) satisfies this principle trivially.) Lastly, (11) is also met, because each of the connective-marked words immediately precedes an expression that contains a matching case value.

4   Concluding Remarks

The Coast Tsimshian data support treating the connectives as affixes on the word that precedes the phrase that the connective relates to. However, this affix location is not problematic for an informationally-rich theory like HPSG: through the EDGE feature and the constraints on it, the relevant syntactic information 'passes' to the appropriate local domains in an entirely unexceptional way. Furthermore, linear precedence portion of the EDGE-based analysis of these 'wrongly'-placed morphs suggests that both dependency relations and linear order can play an important role in licensing certain argument-marking strategies.

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