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RESEARCH NOTE

A Syntactic Approach to Case Contiguity

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Abstract
Building on the empirical results and theoretical insights of Caha (2013), I show how to derive the Case Contiguity Constraint in a syntactic theory of morphology. In particular, I show how to derive *ABA in the domain of case syncretism without appeal to late insertion.

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1. Case Contiguity

In a ground-breaking article, Caha (2013) proposes the following generalization about case syncretism in Classical Armenian:

(1) Case Contiguity Constraint (Classical Armenian)

a. Non-accidental case syncretism is restricted to contiguous regions in the following sequence:

b. NOM – ACC – LOC – GEN – DAT – ABL – INS

The following data from Classical Armenian illustrates the generalization. The noun "nation" is from the declension class of *a*-stems, see Caha (2013, 1055 (81)). Halle and Vaux (1998) call this class declension class I.

(2)

	nation (SG)
NOM	azg-∅
ACC	azg-∅
LOC	azg-i
GEN	azg-i
DAT	azg-i
ABL	azg-ê
INS	azg-aw

In this example, the case forms for LOC, GEN and DAT are syncretic, and those three cases form a contiguous stretch on the case sequence in (11b). Caha gives an account of Case Contiguity in Nanosyntax, which is a realizational theory of morphology (on the definition of *realizational*, see Harley 2015). It is realizational since the phonological forms of the syntactic terminals are supplied after the syntax assembles the syntactic structures. In this respect Nanosyntax is much like Distributed Morphology, which is also realizational (for an analysis of case syncretism similar to Caha's using a different case hierarchy see Zompi 2019, for a DM formulation of Caha's analysis see Bobaljik 2015, 12).

In this paper, I will show how to analyze the data in a non-realizational framework (that is, a framework without late insertion), where lexical items are already specified in the lexicon with their phonological forms

2. The Syntax of Case Features

Caha (2013) accounts for case contiguity in terms of a decomposition of case features:

(3) $[_{ins}\ G\ [_{abl}\ F\ [_{dat}\ E\ [_{gen}\ D\ [_{loc}\ C\ [_{acc}\ B\ [_{nom}\ A\ DP]]]]]]]$

Caha describes this hierarchy as follows:

(4) The tree encodes the proposal that a nominative DP is a type of syntactic constituent, in which the DP is the complement of the feature [A]. The accusative is a similar constituent, one which is built on top of the nominative ([A]) by the addition of [B], so that ACC = [A, B]. And similarly for the other cases: LOC [A, B, C], GEN [A, B, C, D], and so on. Thus, the proposal in essence says that the features A, B, C etc., needed for syncretism, are the primitives of the syntactic structure, and they are ordered in a functional sequence. (Caha 2013, 1030)

Caha speculates on the identity of the features in section 6 of his paper, but their actual identity does not play any role in deriving the contiguity constraint.

Following Caha (2010, 61) (compare to Caha 2013, 1047, (69)), I assume that the DP moves successive cyclically through the case hierarchy in Classical Armenian to yield the order (< . . . > signifies unpronounced occurrence):

(5) $[_{GP}$ DP $[G_{ins}$ $[F_{abl}$ $[E_{dat}$ $[D_{gen}$ $[C_{loc}$ $[B_{acc}$ $[A_{nom}$ <DP>]]]]]]]]

3. Syncretism

In order to analyze syncretism, I make the following assumption (see Collins and Kayne 2023):

(6) Syncretism involves a single morpheme X being used in two different syntactic contexts.

In this definition, morpheme means a pair <FF, PHON> where FF is a set of formal features (of cardinality one or more), and PHON is a set of phonological features (possibly empty). The assumption in (6) generalizes the approach of Kayne (2010), who analyses syncretism between dative clitics and locatives (chapter 6) and syncretism between 1PL object clitics and locatives (chapter 7). Crucially, in the cases Kayne discusses, the contexts are defined in part by empty categories.

Now, in light of (6), consider the case suffixes of "nation". I propose that their lexical items are specified as follows:

(7) a. nominative case: <A_{nom}, ∅> c-selects "nation"
b. accusative case: <B_{acc}, ∅> c-selects "nation"
c. locative case: <C_{loc}, -i> c-selects "nation"
d. genitive case: <D_{gen}, ∅> c-selects "nation"

(7a–7d) are meant to be lexical items. For example, C is a syntactic feature, and /-i/ is its phonological form. The lexical item pairs formal features and phonological features. These lexical items have a particular distributional restriction: they appear with the noun "nation". More accurately, the c-selectional frame specifies a particular declension class, in this case, the *a*-stems.

Given these assumptions, the structure of the locative marked DP will be as follows:

(8) [azg $[_{loc}$ -i $[_{acc}$ ∅ $[_{nom}$ ∅ <azg>]]]]
(= azg-i, locative singular of "nation")

The structure of the genitive marked DP will be as follows:

(9) [azg $[_{gen}$ ∅ $[_{loc}$ -i $[_{acc}$ ∅ $[_{nom}$ ∅ <azg>]]]]]
(= azg-i, genative singular of "nation")

As (8) and (9) show, the reason genitive and locative are syncretic is that the genitive feature D_{gen} is silent (see (7d)). Therefore, we have analyzed syncretism in the case paradigm in Classical Armenian in a way that is consistent with (6).

In the remainder of this section, I will try to respond to some possible objections to my analysis of syncretism.

First, the c-selectional specifications I have postulated in (7) are non-local, in the sense that they seem to take place across several intervening functional categories all the way down to the declension class of "nation". To respond to this objection, I assume that the c-selectional features can be satisfied when the DP moves successive cyclically through the case hierarchy. In other words, the c-selectional feature in (7c) is satisfied when the DP moves through the spec of the locative case projection.

Second, there is a question of whether it is possible for declension class to participate in c-selection at all. What if declension class were a purely morphological feature, invisible to syntactic operations and principles? It is relevant to note here that declension class in Classical Armenian is signaled by an overt affix that appears overtly in the instrumental case (singular and plural), and in the DAT/GEN/ABL in the plural (Caha 2013, 1044, see also Halle and Vaux 1998, 232). In fact, Caha postulates that there is a ClP (Classifier Phrase, see page 1047), which plays an important role in the formulation of lexical entries. These facts suggest that declension class is fully integrated into the syntax of Classical Armenian, and there should be no problem for a particular ClP to be c-selected by some other syntactic head (as in (7)) (But see Caha 2021 arguing against reference to declension class features in Russian.) Similarly, Myler (2024, 3) claims that in Latin: "Declension class is often exponed overtly via a theme vowel." This suggests that declension class in Latin is represented by a morpheme heading a functional projection.

Third, I postulate four lexical entries in (7), but Nanosyntax could capture the same data with two lexical entries (which are inserted post-syntactically). A similar remark holds for Distributed Morphology, which would only require two vocabulary items. It is unclear to me what the force of this objection is. The most important issue is that of language acquisition. How hard would the various systems be for a child to learn? In my system, the child simply goes through the relevant morphemes and fixes their phonological values (presumably when they are first encountered). In both Nanosyntax and DM a much more elaborate task needs to be carried out, choosing amongst a very large set of possible lexical items to fit the data.

4. Spell-Out

The above account raises the question of how the ablative of "nation" is spelled out. Given the data in (2), a natural lexical entry would be the following:

(10) ablative case: [C_{abl}, -ê] c-selects "nation"

But then the structure for an ablative marked noun “nation” would be:

(11) [azg [$_{abl}$ -ê [$_{dat}$ ∅ [$_{gen}$ ∅ [$_{loc}$ -i [$_{acc}$ ∅ [$_{nom}$ ∅ <azg>]]]]] (=*azg-ê-i)

The problem is that in this structure, both the locative and the ablative suffixes appear. Presumably this is not possible. Although I have not checked with a native speaker consultant, no such form appears in Caha’s paper (see Caha 2013, 2010, (6)). Rather, each inflected noun takes at most one overt case marker suffix.

The following constraint on spell-out is needed:

(12) No Crowding Constraint
In the extended case projection of a noun (see (5)), only the highest overt case marker is spelled out. The other case markers are unpronounced.

For the ablative of “nation”, this constraint correctly predicts that only the ablative case marker is spelled out, yielding *azg-ê* (see (2)). Even though there is one other case marker in the representation in (11), it is not spelled-out because of the constraint (12). See Myler (2024) for a proposal on how to generalize (12) to related phenomena in Latin.

Let’s return to check our earlier results. For the locative, the prediction is *azg-i*, since the highest overt case marker is *-i* (see (8)). For the genitive, once again the prediction is *azg-i*, since the highest overt case marker is *-i* (see (9)). So, all the earlier results stand.

What motivates the constraint in (12)? I suggest that it is in the same family of constraints as the Double Filled-Comp Filter (DFCF), which is illustrated in (13):

(13) a. The man that I saw. (*that* is in Comp)
b. The man who I saw. (*who* is in Spec CP)
c. *The man who that I saw. (*who* is in Spec CP, *that* is in Comp)

I assume that the DFCF constrains spell-out at the edge of a CP phase. In the case in (13), either the specifier or the head of CP can be spelled out, but not both. For relevant discussion of the Doubly Filled Comp Filter, see Collins (2007), Koopman and Szabolcsi (2000, 4, 40), and Batlin (2010).

Collins (2007) gives a related constraint applying to all strong phase heads (not just CPs):

(14) a. Edge(X) must be phonetically overt.
b. The condition in (14a) applies in a minimal way so that either the head or the specifier, but not both, are spelled-out overtly.

I will not try to unify (12) and (14). One difference is that (12) mentions the “highest” element, but (14) does not. But clearly there are in the same family of constraints relating syntactic structure to PF (sensorimotor) interface representations.

They both limit spell-out of certain syntactic domains to exactly one element of that domain.

I assume that (12) and (14) are not morphological constraints: they do not have to be specified as part of a post-syntactic 'morphological component'. Rather, I suggest they are economy constraints on how syntactic structure is spelled-out.

5. Parametric Variation

Caha (2010) discusses many examples of languages that allow case stacking. In these languages, several overt case morphemes appear stacked up on one noun. He gives the following kinds of examples:

(15) a. N-ACC-GEN (Caha 2010, 41)
b. N-GEN-DAT (Caha 2010, 43)

For example, according to Caha, in Ingush "the expression of the dative case includes the genitive marker as its proper part" (Caha 2010, 43).

Case stacking is significant for Caha since it gives overt evidence of how the cases are related syntactically. The question is why the No Crowding Constraint does not block case stacking examples such as (15)?

Looking over the languages in Caha's article, there is a striking gap. All of the stacking languages have mirror image orders of the case morphemes following the noun, as in (16a). None of them have orders where the asymmetric c-command relations are mapped directly onto left-right linear order, as in (16b):

(16) a. Noun-A_{nom}-B_{acc}-C_{loc}
b. *Noun-C_{loc}-B_{acc}-A_{nom}

The generalization can be stated as follows:

(17) For post-nominal case stacking, the overt case morphemes are always in the following order: A_{nom}-B_{acc}-C_{loc}-D_{gen}-E_{dat}-F_{abl}-G_{ins}.

The analysis I give of this generalization follows Caha (2013, 47) in relating it to the kind of derivation involved (roll-up for (16a) versus successive cyclic for (16b)).

Lack of case stacking of the form in (16b) suggests that the No Crowding Constraint applies as a universal without exception to structures of the form in (18). In this kind of structure, the noun moves successive cyclically, leaving the order the case heads unchanged:

(18) $[_{CP}$ DP [C $[_{BP}$ <DP>[B $[_{AP}$ <DP> [A <DP>]]]]]]]

In this structure, C is the highest head, and it is spelled-out conforming to (12).

On the other hand, with mirror image orders (derived by roll-up movement), the No Crowding Constraint does not apply:

(19) $[_{CP}\ [_{BP}\ [_{AP}$ DP [A <DP>]][B <AP>]] [C <BP>]]

The problem here is that there is no highest case marker. For example, A does not c-command B, nor does B c-command A, so the No Crowding Constraint in (12) is inapplicable Hence, stacking of case markers in mirror image orders following the noun is not ruled out.

As a side note, I do not adopt Caha's approach to motivating successive cyclic movement versus roll-up movement in terms of Spell-Out Driven Movement (Caha 2013, 50). Rather, the movement possibilities in the case hierarchy (successive cyclic, roll-up, or a combination) are similar to those found by Cinque (2005) in his study of modifier (DET, NUM, ADJ) orders in the DP. But for modifiers in the DP, there is no question of motivating the movements by Spell-Out Driven Movement, since in the general case all the modifiers are overt.

6. Deriving Case Contiguity

It is possible to prove the Case Contiguity Constraint in the above system (equivalently, *ABA in the domain of case marker syncretism). We only need one more general assumption (see Kayne 2019, section 2 for related discussion, see Myler 2024 for some suggested revisions to (20)):

(20) No Accidental Homophony of Case Markers
Other than zero forms, there can be no accidental homophony of case markers for a single noun. That is, two case markers cannot be specified in the lexicon as having the same phonological form.

Now consider the proof of the Case Contiguity Constraint in (1). Suppose that that there is a counter example. To be concrete, consider the hypothetical noun X. CASE 1,2,3 are three contiguous cases in the case sequence. a,b,c are three case suffixes.

(21)

	X (SG)
Case 1	X-a
Case 2	X-b
Case 3	X-c

Here we have a counter-example to the Case Contiguity Constraint (an example of *ABA), since CASE 1 and CASE 3 are syncretic, but they are not contiguous on the case sequence. My claim is that there is no way of assigning values to lexical items that would yield this pattern. There are three cases to consider, depending on the lexical entry for CASE 3.

(22) a. <Case 3, ∅>

b. <Case 3, a>

c. <Case 3, b>

If we assign the lexical item for CASE 3 the zero phonological form ∅, then by the Case Spell-Out Constraint, the pattern should be a-b-b, not a-b-a (since b would be the highest overt case marker). If we assign the lexical item for CASE 3 the phonological form /a/, then it will be accidentally homophonous with the phonological form for CASE 1. If we assign the lexical item for CASE 3 the phonological form /b/, then we expect the pattern a,b,b, not a,b,a. Furthermore, such a lexical entry will be accidentally homophonous with the lexical entry for Case 2. There are no other relevant possibilities for the phonological form of CASE 3.

Since no counter-examples to the Case Contiguity Constraint can be derived in our system of assumptions, it follows that there are no such counter-examples, and the Case Contiguity Constraint holds. The explanation of the Case Contiguity Constraint comes down to the interaction of lexically specified zero morphemes, the No Crowding Constraint and the No Homophony Constraint.

7. Lexical Zeros

By lexical zero, I mean a zero phonological form specified in the lexicon, as in the nominative, accusative and genitive cases in (7). Clearly, such lexical zeros are allowed by UG. In English, there are nouns with zero plural suffixes, such as *deer*(sg.)/*deer*(pl.). Mass nouns also do not take a plural suffix in English, but these nouns are not mass nouns. For example, they can be modified by numerals: *three deer*.

The above account of syncretism crucially relies on lexical zeros. For example, in (7) there are three lexical items with a zero phonology form (NOM, ACC and GEN). Why doesn't such a situation violate (20) No Accidential Homophony? I suggest that in these cases the morphemes are not specified as having any phonological form at all. Because of this, there is no violation of (20), which specifically refers to lexical items having phonological forms. From that perspective, there is no need for any stipulation to the effect that (20) does not hold for lexical zeros.

Consider the issue for a language learner. In the language acquisition process, all morphemes start out as unspecified for phonological features (by assumption). If the child does not find a non-zero phonological form for a particular morpheme, it is simply left unspecified. No change needs to be made. But for the non-zero forms, the child actually needs to act to fix the phonological form one way or the other. As part of this decision-making process, they check whether the apparent non-zero phonological form (taken from words that they encounter in the primary linguistic data) does not match any others. From this sketch, it is clear that only the non-zero forms should be expected to be subject to (20).

Note that accidental homophony of lexical zeros has a very different status from accidental homophony of non-zero forms in my framework. Admitting accidental homophony of non-zero forms would mean that the *ABA constraint would have to be abandoned. But such a constraint is a good candidate for a universal, providing strong linguistic evidence for (20). And as I have shown in my demonstration in Section 6, the existence of lexical zeros is actually part of the reason *ABA holds.

8. Conclusion

I have shown that it is possible to derive Caha's (2013) Case Contiguity Constraint in a non-realizational theory of morphology.

Every assumption invoked above relates to assumptions independently needed in syntax (see also Collins and Kayne 2023):

(23) a. Morphemes are of the form <FF, PHON>, relating a set of formal features and a phonological form.
b. Morphemes are combined by Merge.
c. Morphemes may have a lexically specified zero phonological form.
d. In certain syntactic configurations (specified in (12) and (14a)), morphemes may fail to be spelled-out, even if they have a non-null lexically specified phonological form (see Kayne 2005, 2010, Collins 2007).

There is nothing in this approach that requires any post-syntactic operations, any use of a morphological component, or any post-syntactic late insertion of phonological exponents. Therefore, I take the account I have given to be a purely syntactic approach to case syncretism in Classical Armenian.

There is much more in Caha's interesting article that remains to be captured in my non-realizational account. For example, instrumental case behaves in a particular way with respect to the marking of plurality. Also, class markers are realized in certain plurals, but not others. I leave these issues to future work.

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