Ban on simultaneous spell-out of multiple features in the CP domain: the case of Arapaho

Ksenia Bogomolets

UConn

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1. Introduction[1]

This paper provides an analysis of a wide range of morpho-syntactic phenomena in the verbal complex in an Algonquian language Arapaho. The focus of this study is on a process widely spread in Algonquian languages and known in the literature as *Initial Change* (*IC* or *infix* henceforth). The details of the phonological realization and morpho-syntactic distribution of IC differ across languages (Taylor 1967; Costa 1996; Salmons and Macaulay 2003; Proulx 2005).

In Arapaho, the process infixes *<V(n)>* after the initial consonant of the verb form in the appropriate morpho-syntactic environments. Compare examples (1a) and (1b),

[1] [Acknowledgements]. Most of the Arapaho data cited in this paper are taken from Cowell & Moss (2008); the citations for those examples are given in the format: (C&M, page number).

and examples (2a)-(2b) below. IC surfaces in the a-examples while the b-examples are not infixed with IC. The IC infix is bolded[2]:

(1a) Stem: niibéi– 'to sing'
n<**én**>iibéi–noo
<**IC**>sing–1SG
'I am singing.' (C&M, 26)

(1b) ne–ihoowú–niibéi
1SG–NEG–sing
'I am not singing.' (C&M, 26)

(2a) Stem: betéee– 'to dance'
b<**e**>etéee–noo
<**IC**>dance–1SG
'I am dancing.' (C&M, 30)

(2b) né–íhoowú–betéee
1SG–NEG–dance
'I am not dancing.' (C&M, 30)

IC only occurs in the left-most syllable of the verb forms. IC infixes /Vn/ into the first syllable of a verb if that syllable contains a long vowel, and it infixes /V/ if the vowel in the first syllable is short. (3a) below captures the data in (1a), and (3b) describes the example in (2a)[3]:

(3a) CV1:CV… → C<**Vn**>V1:CV
where <Vn> is either /en/ or /on/ depending on vowel harmony
V1: is long

(3b) CV1CV… → C<**V**>V1CV
where <V> is of the identical quality as V1
V1 is short

[2] Abbreviations used in the paper: 'X/Y' = portmanteau marker for X acting on Y; '1, 2, 3' = 1st, 2nd, 3rd person; 'ADV' = adverb; 'AO' = affirmative order; 'C' = consonant; 'COMP' = complement; 'CT' = clause type; 'DAT' = dative; 'DUB' = dubitative; 'EVID' = evidential; 'ExclF' = exclusion feature; 'FUT' = future; 'HAB' = habitual; 'IC' = initial change; 'IMP' = imperfective; 'IMPER' = imperative; 'IMPERS' = impersonal; 'INCHOAT' = inchoative; 'INTER' = interrogative; 'LOC' = locative; 'NAO' = non-affirmative order; 'NEG' = negation; 'NOMIN' = nominalizer; 'PAST' = past; 'PERF' = perfective; 'PL' = plural; 'POL' = polarity; 'Q' = question; 'SG' = singular; 'SUBJ' = subjunctive; 'T' = tense; 'TRNS' = transitive; 'V' = vowel; 'wh-' = wh-question.

[3] The rules are stated informally to demonstrate how Initial Change operates; no specific claim is being made about their appropriate formulation.

The quality of the vowel is determined by rules of back harmony across the nasal in a syllable with a long vowel (3a) and full vowel harmony in a syllable with a short vowel (3b).

The process of infixation applies only to finite verbs, i.e. it is never attested in participles, deverbal nouns or adjectives. Compare, for example, the following verbal forms and nouns derived from them:

(4a) Stem: bíxooθ– 'love'
b**<í>**íxooθ–éθe–n
<IC>love–1SG–2SG
'I love you.' (C&M, 110)

(4b) bixóóθ–etíít
love–NOMIN
'love' (C&M, 110)

(5a) Stem[4]: eenetíθ– 'speak'
h**<en>**eenétiθ–éθe–n
<IC>speak–1SG–2SG
'I am speaking to you.' (C&M, 110)

(5b) heenetíθ–etíít
speak–NOMIN
'a conversation' (C&M, 110)

In this paper, I argue that IC is a morpheme, specifically an infix, and that its distribution is best explained by positing that the morpheme marks [+realis] mood. The major theoretical claim of this study is the following. IC, being the [+realis] morpheme in Arapaho, appears in a high functional projection in the clause, namely C; it is analyzed as the spell-out of C[+realis]. As such, it competes for this position with a number of morphemes belonging to the CP domain in the language. I will argue that the competition for the C head is driven by the structural properties of the verbal morphology rather than by specific features expressed by the competing morphemes. More specifically, I will suggest that Arapaho is a *simple CP language*, meaning that only one C head can be present in a clause at a time. C[+realis], spelled-out as IC, competes with the C heads with other featural specifications, such as

[4] Words in Arapaho cannot start with an onsetless syllable, any underlyingly vowel-initial morpheme is epenthesized with an /h/ if word-initial.

C[COMP] (required in complement clauses), C[+Q, ±Pol] (required in polar questions), and others.

The analysis of the IC in Arapaho as the spell-out of C[+realis] presented in this study results in a whole range of analytical advancements in understanding the verbal complex in the language:

a. it explains the allomorphy pervasive in tense and aspect prefixes in Arapaho;
b. it provides an analysis of the competition between two kinds of negation in the language;
c. it gives an explanation for the empirical fact that a large number of morphemes in the verbal structure are in complementary distribution.

The structure of this paper is as follows. **In section 2,** I start with presenting the distribution of IC across tenses and aspects to support the empirical argument that IC in Arapaho marks [+realis]. **In section 3,** I analyze the patterns of complementary distribution between IC and a large number of morpho-syntactic elements in the language, and I claim that all of those patterns can be explained if Arapaho is analyzed as a *simple CP language*. I show that the consequences of such approach span beyond the competition among the C heads in that the distribution of two kinds of negation in Arapaho can be explained with the proposed model of syntactic competition in the language. I conclude with a brief discussion of the claims in **section 4.**

2. Initial Change across tenses and aspects

The goal of this section is to determine what IC is, i.e. what it does in the language. Answering this question will pave the way to understanding the place of IC in the structure and will be crucial for explaining the observed patterns of complementary distribution between IC and a large number of elements in the language. There has been a debate in the literature as to whether Algonquian languages grammatically mark the [±realis] distinction (cf. Frantz 1991; Ritter & Wiltschko 2010). In this section I present novel paradigms which suggest that the [±realis] contrast is marked in Arapaho. Specifically, I argue for the following generalization:

(6) *Initial Change* marks [+realis] in Arapaho.

In the course of this section, I will provide motivation for the generalization in (6), and I will demonstrate how a number of morpho-syntactic constructions can be unified as involving [+realis] mood. In this section, I discuss allomorphy on the left edge in the verbs in present, future and past tenses, as well as in two morphologically marked aspects – imperfective (habitual) and perfective. I first address the interaction between IC and Affirmative/Non-Affirmative orders of agreement which are the Arapaho-specific reflex of the Independent/Conjunct morphology in other Algonquian languages. I will claim that presence/absence of the IC infix marks [±realis] contrast which does not directly correlate with the Affirmative/Non-Affirmative orders of agreement. I then argue that while verbs in present and future tenses and in perfective aspect participate in the [±realis] contrast, verbs marked for past or imperfective do not, instead they only mark the Affirmative/Non-Affirmative distinction. As stated in the introduction, this paper is arguing for treating IC as one of the instantiations of C^0 competing with the other CP-level elements. In that light, the argument presented in the current section, namely that IC is a [+realis] marker, is central to placing it in C.

2.1 Initial Change and agreement paradigms

Let us begin with considering the morpho-syntactic contexts where IC applies in Arapaho. In what follows, I will show that IC in verbs in present and future tenses and in perfective aspect is a [+realis] morpheme. Evidence for this claim comes from the distribution of IC – the cases where IC does not occur can be grouped together under the traditional term [-realis] or *irrealis*[5], namely: (i) negative statements (7b); (ii) questions (7c), (iii) subjunctive (7d), imperatives (7e), and (iv) clauses with dubitatives, modals and evidentials (7f). Contrast (7a) where IC does apply with (7b-f) where it does not:

(7a) b<**e**>etéee–noo
<**IC**>dance–1SG
'I am dancing.' (C&M, 26)

[5] At this point I do not propose any particular semantic analysis for the concept of *irrealis*, rather it is employed here as a label traditionally used to describe the contexts discussed in this section. I propose a more detailed analysis of the category of *irrealis* in Arapaho in section 2.2.

(7b) ne–ihoowú–betéee
1–NEG–dance
'I am not dancing.' (C&M, 26)

(7c) koo–ne–betéee
INTER–1–dance
'Am I dancing?' (C&M, 26)

(7d) betéee–noo–hók
dance–1SG–SUBJ
'If I dance.' (C&M, 482)

(7e) betéee
dance
'Dance!' (2Sg) (C&M, 482)

(7f) heʔih–betéee
EVID–dance
'(They say) he was dancing.' (CL)

It has been noted that the absence of IC frequently coincides with the so-called *Non-Affirmative Order* of agreement in the language (Cowell & Moss 2008). I argue that IC does not simply mark the contrast between *Affirmative* and *Non-Affirmative agreement orders* (AO and NAO, respectively). In order to show that the AO/NAO agreement contrast and the contrast marked by IC are not the same, we need to take a detour and introduce the AO/NAO paradigms in more detail in Algonquian generally, and in Arapaho specifically.

All Algonquian languages, including Arapaho, distinguish two patterns of agreement (see Brittain 2001; Campana 1996; Cook 2007, 2008; Goddard 1974a, b, 2007; Richards 2004; Oxford 2014):

a. Highly fusional suffixal agreement – Algonquian: *Conjunct;* Arapaho: *Affirmative.*
b. Prefix + suffix agreement – Algonquian: *Independent;* Arapaho*: Non-Affirmative.*

The traditional terminology for the two paradigms in the literature on Arapaho (Affirmative and Non-Affirmative orders) differs from the rest of Algonquian (Independent and Conjunct orders). Moreover, some of the detailed analyses of the Independent and Conjunct orders presented in the literature on other Algonquian

languages are not directly applicable to the Arapaho data because the morpho-syntactic conditions which govern this alternation appear to be quite different.

In Arapaho, the difference between the two agreement paradigms is twofold. Firstly, the two paradigms have two distinct sets of agreement affixes; secondly, in affirmative order person, number and obviation markers are suffixed to the verb stem while in non-affirmative order person markers are prefixed, and number and obviation are indicated by suffixes. Compare AO (8a-b) where all agreement is in the suffixes to (8c-d) where verbs are marked with NAO agreement, and person is prefixed while number agreement is suffixed:

(8a) b<e>etéee–**n** **Affirmative**
<IC>dance–**2SG**
'You (Sg) are dancing.' (C&M, 482)

(8b) b<e>eteéé–**nee**
<IC>dance–**2PL**
'You (Pl) are dancing.' (C&M, 482)

(8c) **hé–**íhoowú–betéee–**Ø** **Non-affirmative**
2–NEG–dance–**SG**
'You (Sg) are not dancing.' (C&M, 482)

(8d) **hé**–íhoowú–beteéé–**be**
2–NEG–dance–**PL**
'You (Pl) are not dancing.' (C&M, 482)

It has been proposed (Cowell & Moss 2008) that IC marks the distinction between AO and NAO agreement where verb forms infixed with IC correspond to AO, and verbs not infixed with IC correlate with NAO. However, this generalization does not hold. Contrast the contexts where IC applies in present and future tenses, and in perfective aspect and the distribution of AO/NAO agreement:

Table 1. Distribution of Affirmative/Non-Affirmative agreement orders vs. IC

Clause type	**AO/NAO**	**IC**
Positive	AO	+
Subjunctive	AO	-
Imperative	AO	-
Evidential	AO	-
Evidential	NAO	-
Negative	NAO	-
Interrogative	NAO	-

As Table 1 shows, the AO/NAO distinction only partially correlates with IC. The AO shows IC only when the verb is [+realis], and not when it is [-realis]. I present two kinds of empirical evidence in favor of this claim[6].

The first piece of evidence comes from the Affirmative Order clauses with evidential markers. Consider the following examples of clauses with particle *wootíí*. In both (9a) and (9b) below, verbs are marked with AO affixes (bolded), however, in (9a), the verb *hesookuʔooθiʔ* 'to watch' does not undergo IC while in (9b), the verb *h**o**oθíʔeebéénoo* 'to be asked to do s.t.' does (IC infix bolded):

(9a) Stem: esooku'oo– 'to watch s.t.'
wootii hesookuʔoo–**θiʔ**
like watch–**3PL**
'It seems they are watching.' (CL)

(9b) Stem: oθiʔeebee– 'to be asked to do s.t.'
nenéé́ni–noo wootíí h<**o**>oθíʔeebéé–**noo** héét–niiteheib–éθen
to.be–1SG like <**IC**>to.be.asked–**1SG** FUT–help–1SG/2SG
'I will help you like I am asked to do.' (C&M, 320)

The explanation for the difference between (9a) and (9b) is the following. The particle *wootíí* can have two different meanings: (a) it can be an evidential marker with the meaning 'it seems that'; (b) it can be a conjunction, with the meaning 'like/as'. As predicted by the generalization in (6), no IC occurs in clauses under the reading (a) because the evidential marker makes it [-realis], while the verb undergoes IC under the reading (b). Note also that some evidential markers require AO in the language while others require NAO, and IC cannot be infixed in either case (cf. Table 1), which supports the claim made here, namely, that IC is a [+realis] marker rather than an AO/NAO marker.

The second piece of evidence for my claim that IC marks a contrast separate from the affirmative and non-affirmative agreement orders comes from verbs marked with

[6] It should be noted that AO/NAO distinction is independent of the matrix/embedded distinction in the language: both embedded and matrix clauses can be marked with either of the two agreement paradigms and the distribution of the paradigms depends solely on the morpho-syntactic contexts in Table 1. The [±realis] distinction manifested by IC, however, is only observed in matrix clauses (see section 3.1 for further discussion on the embedded clauses).

subjunctive. These verbs take affirmative order agreement affixes (bolded in (10) below). However, verbs in subjunctive never undergo IC:

(10) betéee–**noo**–hók
dance–**1SG**–SUBJ
'If I dance.' (C&M, 482)

In (10), the verb takes affirmative order agreement suffix but no IC occurs, which can be explained by the *realis* generalization proposed here assuming that Subjunctive is one of the [-realis] contexts in the language.

I propose that the IC should be analyzed as the [+realis] morpheme situated in C which thus combines with the syllable on its right. In morphologically unmarked simple present tense, this means combining with the stem-initial syllable:

(11a) n**<en>**iibéíʔ–it
<IC>sing–3SG
'He is signing.' (C&M, 30)

(11b) [$_{CP}$ C[+realis] **<en>** [$_{VP}$ [$_{vP}$ *v* [$_{√P}$ **niibeiʔ-**]]]]

The verb in (11a) has the structure (11b) where the IC infix <en> is generated in the C head and is in the local relationship with the verb stem. It is then repositioned by phonology to combine with the stem-initial syllable. Assuming IC infixes into the morpheme that is locally interacting with the C head, we should expect IC to affect prefixes between the C head and the verb root in case any such prefixes are present in the structure. This is indeed what we observe. The relevant evidence comes from the interaction between IC and the future tense and perfective aspect prefixes.

Both future tense prefix and perfective aspect prefix have both an infixed and an uninfixed forms. The alternations in (12a-b) below are generally analyzed as instantiation of IC (Cowell & Moss 2008):

(12a) Future tense prefix: /het–/ - /h**<e>**et–/
(12b) Perfective aspect: /hiis–/ - /h**<en>**iis–/

The patterns of distribution of IC exemplified in (8)-(10) above for present tense are exactly parallel for verbs marked for future tense and perfective aspect. In [+realis] contexts, the future prefix and the perfective prefix are infixed while in [-realis] contexts, i.e. in negative statements (13b), questions (13c), imperatives (13d), subjunctive (13e), and in clauses with dubitatives, modals and evidentials (13f) verbs

are prefixed with the uninfixed form of the future and perfective morphemes. Contrast examples in (13a-f) below for the future tense prefix:

(13a) **h<é>ét**–niibéí–ʔit
<IC>FUT–sing–3SG
'He is going to sing.' (C&M, 292)

(13b) koo=he–**et**–niibéi
INTER=2SG–**FUT**–sing
'Will you (Sg) sing?' (C&M, 95)

(13c) **hetn**–eihoow–biiθihi ceʔ–iihiʔ
FUT–NEG–eat again–ADV
'Once again he won't get to eat.' (CL)

(13d) **het**–cih–nohkúseic–óʔoo
FUT–to.here–morning–INCHOAT
'Come early in the morning!' (C&M, 218)

(13e) **hét**–niibei–ʔihók
FUT–sing–3SG:SUBJ
'He is supposed to/supposedly going to sing.' (C&M, 292)

(13f) wohóéʔ–**et**–éiʔíít–owuu.
DUB–**FUT**–withstand–3PL
'[We'll see] whether they'll be able to withstand [the test].' (C&M, 254)

If an overt aspect prefix is present but no overt tense marking, it is the aspect prefix that is infixed with IC in the appropriate contexts:

(14a) h<**en**>iis–biiθíhi–noo
<IC>PERF–eat–1SG
'I have eaten.' (C&M, 93)

(14b) [$_{CP}$ C[+realis] **<en>** [$_{AspP}$ Asp[perf] **iis-** [$_{VP}$ [$_{vP}$ *v* [$_{√P}$ **bii3íhi-**]]]]]

In (14a) above, the perfective prefix *hiis-* is infixed with the IC morpheme. The structure of the verb form is given in (14b): the IC infix *<en>* in the C head is in the local relationship with the aspect head and gets repositioned by phonology to combine with the perfective prefix. If an overt tense marker is present, it is that tense marker that will be infixed with IC and the aspect marking will have no effect. Consider the example in (15a) below: the IC morpheme is infixed into the future tense prefix *het-*:

(15a) h<**é**>ét–niis–biiθíhi–noo
<IC>FUT–PERF–eat–1SG
'I will have eaten.' (C&M, 93)

(15b) [$_{CP}$ C[+realis] **<e>** [$_{TP}$ T[fut] **het-** [$_{AspP}$ Asp [perf] **iis-** [$_{VP}$ [$_{vP}$ *v* [$_{√P}$ **biiθíhi-**]]]]]]

In the structure in (15b), the IC infix *<e>* is interacting with the future tense prefix *het-* which is the closest to the C head, while the perfective aspect prefix remains unchained since the overt tense prefix intervenes between the C[+realis] and the Aspect head.

Considering data and patterns presented in the current section, I propose that the same morpho-syntactic process of IC applies to present, future and perfective verb forms to mark the [±realis] contrast.

In the next section, I present the following claim: IC does not apply to verbs in the past tense or in imperfective aspect, i.e. there exists a tense- and aspect-related asymmetry whereby verbs in past and imperfective do not participate in the same contrast as verbs in present, future and perfective; instead they are marked only for the contrast between affirmative and non-affirmative agreement.

2.2 Initial Change and Irrealis

In the previous section, I argued that *Initial Change* marks [+realis] in Arapaho. The patterns of distribution of IC in present and future tenses and in perfective aspect provided evidence supporting that claim. Moreover, I have shown that there is no one-to-one correlation between the IC ([+realis]) and the two agreement paradigms found in the language. In this section, I will argue that verbs marked for past tense and imperfective aspect do not take part in the [±realis] contrast, rather the allomorphy on the left edge of those verb forms marks the contrast between the two agreement paradigms – affirmative and non-affirmative agreement orders. After presenting this argument, at the end of this section, I will offer a morphological impoverishment analysis for the absence of the [±realis] contrast (and, hence, the impossibility of the IC) in past tense and imperfective aspect; based on cross-linguistic data and research, I will suggest that past tense and imperfective aspect are inherently [-realis] in Arapaho.

2.2.1 Allomorphy in past tense and imperfective aspect

The simple past prefix in Arapaho alternates between two allomorphs: *nih-/hih-*. It has been claimed that this alternation reflects the same contrast as IC in present and

future tenses: "This is an irregular form of initial change (…) when [the past tense prefix] occurs word-initially where initial change does not occur (as in non-affirmative verbs), it occurs as *hih-*" (Cowell & Moss 2008, 256). This description states that the distribution of the allomorphy in past tense prefix is reflecting the same contrast as the distribution of the [+realis] infix in present and future tenses, where the *nih*-forms correspond to the forms which undergo IC in present and future. However, this generalization fails to account for the empirical facts. I argue that the distribution of the infix in future and present tenses and the distribution of the allomorphs *nih-/hih-* for past differ systematically.

In present and future, the [+realis] infix has no one-to-one relation to affirmative/non-affirmative agreement orders, as shown in Table 1 and in (9) and (10) above. However, allomorphy in past prefix is sensitive to precisely this contrast:

Table 2. Distribution of simple past allomorphs, AO/NAO agreement and IC

Clause type	**AO/NAO**	**Past prefix**	**IC**
Positive	AO	nih-	+
Subjunctive	AO	nih-	-
Imperative	AO	NA	-
Evidential	AO	nih-	-
Evidential	NAO	hih-	-
Negative	NAO	hih-	-
Interrogative	NAO	hih-	-

Treating the *nih-/hih-* alternation as reflecting AO/NAO rather than [±realis] predicts that in any clause with affirmative order agreement, past tense will be marked with the *nih-* prefix, even in [-realis] contexts. This prediction is borne out. Contrast examples of verbs marked with Subjunctive in present (16a), future (16b), and past (16c):

(16a) betéee–noo–**hók**
dance–1SG–**SUBJ**
'If I dance.' (C&M, 482)

(16b) nih–niitóbee–noo **hét**-noʔúsee-hé-**hk**.
PAST.AO–hear.news–1SG **FUT**–arrive–3SG–**SUBJ**
'I heard that he will come.' (C&M, 268)

(16c) a hiiwoʔ **nih**–biiciθei–nin–**ehk**
a so **PAST.AO**–bead.things–2SG–**SUBJ**

'Ah! So you knew how to sew!' (meaning: 'I didn't know you knew how to sew!') (C&M, 293)

Subjunctive is one of the [-realis] contexts in the language, hence verbs marked for Subjunctive can never be infixed with IC in present and future (16a-b), however, verbs in Subjunctive are marked with affirmative order agreement affixes, and in accordance with Table 2, past tense is marked with the *nih-* prefix (16c).

The distribution of the imperfective prefix allomorphs *nii-/hii-* is exactly parallel to the distribution of the simple past prefix: *nii-* occurs exclusively in AO clauses and *hii-* is prefixed to the verbs marked with NAO affixes[7]. Compare the examples below. In the AO clause in (17a), imperfective aspect is marked with *nii-* while in the clauses where NAO is required – in negative clauses (17b) and interrogative clauses (17c), imperfective is marked with *hii-:*

(17a) **nii**–neyéiθéí–t
IMP.AO–go.to.school–3SG
'S/he goes to school.' (C&M, 93)

(17b) **hii**–hoow–niisíθei
IMP.NAO–NEG–work
'S/he doesn't work, doesn't have a job.' (C&M, 94)

(17c) **hii**–tohúúcxooyéí–biiθhíítoon
IMP.NAO–at.what.time–eat
'Around what time do we eat?' (C&M, 243)

As noted above and illustrated in (16), the crucial point of difference between the application of IC in present and future tenses and in perfective aspect, and the alternation in past tense and imperfective aspect prefixes is observed in Subjunctive. Being sensitive to the AO/NAO distinction and not to the [±realis] distinction, the imperfective prefix, just like the past tense prefix (cf. (16c) above), has the /n/-initial form in Subjunctive:

(18) niiʔeihii–hoʔ **nii**–noʔoteihi–**ehko**–niʔ
eagle–PL **IMP.AO**–strong–**SUBJ**–PL
'They say that eagles are powerful.' (CL)

[7] Note that in both past tense and imperfective aspect prefixes, the same alternation /n/-/h/ appears to be marking the AO/NAO distinction suggesting that *hih- /nih-* and *hii- /nii-* can be compositional where /n/ marks the AO.

2.2.2 Why past and imperfective?

The absence of IC in past tense and imperfective (habitual) aspect requires an explanation. Recall the main empirical claim that is being made in the current section, namely that IC marks [+realis] in Arapaho. The connection between IC and the [±realis] contrast has been noted for a number of Algonquian languages (Brittain 2001; James 1982a, 1991; Rogers 1978). This claim will be central for the discussion of the place of IC in the verbal structure presented in the next section. Below, I present an analysis for the lack of IC in past tense and imperfective aspect in line with the proposal that IC is the spell-out of C[+realis]. I argue for a morphological impoverishment account for the lack of IC, and I argue that impoverishment is triggered by a markedness constraint to avoid conflicting feature values for [±realis]. Based on the ample cross-linguistic evidence for past/imperfective being specified as [-realis], I propose that IC ([+realis]) is not possible in past and imperfective due to the feature clash.

Formally, to capture the exceptionality of past tense and imperfective aspect, an impoverishment rule can be invoked (Halle 1997; Noyer 1997). Such a rule (19) will delete the [+realis] feature on C if it is adjacent to past tense or imperfective aspect which would result in the lack of IC:

(19) [+realis] → Ø / __ {PAST, IMP}

Assuming neither T nor Asp are cyclic heads (Marantz 2007; Embick & Marantz 2008; Embick 2010), the C head and T and Asp heads are in the same cycle and at the relevant point of derivation, their features are accessible and can force the [+realis] feature on C to be deleted in the context of T[past] or Asp[imp]. The deletion of the [+realis] feature which results in the lack of IC in this context is locally determined by the interaction with the T[past] or Asp[imp]. A sample derivation in the lines of the Distributed Morphology approach (Halle and Marantz 1993; Embick & Marantz 2008; Embick 2010) for a past tense verb, *nihniibéíʔit* ‘he sang’ is given in (20):

(20) nih–niibéíʔ–it
PAST.AO–sing–3SG
‘He sang.’ (C&M, 293)

(i) Structure: [C[+realis] [T[past] [√NIIBEIʔ-]]]
(ii) Impoverishment: [+realis] → Ø / [__ past]

(iii) PF Vocabulary Insertion:
a. niibeiʔ– [√NIIBEIʔ-]
b. nih–niibeiʔ– [T[past] [√NIIBEIʔ-]]
c. nih–niibeiʔ– [C [T[past] [√NIIBEIʔ-]]]

The [+realis] feature on the C head gets deleted by (19) due to the local interaction with the past tense morpheme. Essentially the same derivation can be proposed for verbs prefixed with imperfective (habitual) aspect. In case imperfective is local, i.e. adjacent to the C head, the [+realis] feature on the C head is deleted resulting in the lack of IC.

The claim that the C head and the past or imperfective morpheme must be in a local relation in order for the [+realis] feature to be deleted and, hence, not be spelled-out as IC predicts that in case this local interaction is blocked by an intervening element, C[+realis] might in principle be spelled out as IC even in an imperfective (or a past tense) verb form. This prediction is borne out:

(21) h<**é**>ét–nii–niʔíθecóó–noo
<**IC**>FUT–IMP.AO–happy–1SG
'I will be happy.' (C&M, 86)

(i) Structure: [C[+realis] [T[fut] Asp[imp] [√NIʔIƷECOO-]]]
(ii) PF Vocabulary Insertion:
a. niʔiθecoo– [√NIʔIΘECOO-]
b. nii–niʔiθecoo– [Asp[imp] [√NIʔIΘECOO-]]
c. et–nii–niʔiθecoo– [T[fut] [Asp[imp] [√NIʔIΘECOO-]]]
d. V–et–nii–niʔiθecoo– [C[+realis] [T[fut] [Asp[imp][√NIʔIΘECOO-]]]]
(iii) Phonology: a. e<V>t–nii–niʔiθecoo– INFIXATION
b. e<e>t–nii–niʔiθecoo– VOWEL HARMONY
c. he<e>t–nii–niʔiθecoo– /H/-EPENTHESIS

In (21), the imperfective prefix does not affect the spell-out of C since the aspect prefix and the C head are not in a local relationship: the future tense prefix intervenes. Hence, C is spelled out as [+realis] – the future prefix undergoes IC.

The impoverishment rule in (19) provides us with a tool for capturing the ban on the spell-out of IC in the contexts of past tense and imperfective aspect. This analysis also captures the role of locality: only adjacent tense or aspect is able to force the deletion of the [+realis] feature on C.

The impoverishment account proposed here is rooted in cross-linguistic observations on distribution of the past/imperfective patterns. Past tense and imperfective (habitual) aspect have been reported to pattern together in a number of

ways cross-linguistically (e.g. Bjorkman & Halpert 2013; James 1991). At this point, I will make a stipulation that past and imperfective are inherently [-realis] in Arapaho and therefore cannot combine with the IC infix ([+realis]) due to feature incompatibility. Cross-linguistic evidence supporting this stipulation comes from a widely documented and analyzed fact: two kinds of morphology – past tense and imperfective (habitual) aspect – are used in the vast majority of languages of the world to express the most prototypical case of irrealis, namely, in counterfactual clauses (e.g. Hale 1969; Steele 1975; James 1982a,b; Fleischman 1989; Iatridou 2000; Van Linden and Verstraete 2008). Consider the following examples from English, which regularly employs past morphology to express counterfactual semantics (22):

(22a) (I don't think he will take my advice, but . . .)
If he took my advice, he would get the job.

(22b) (He isn't friendly, but . . .)
If he were friendly, I would invite him.

(22c) (I didn't have the car yesterday, but . . .)
If I had had the car, I would have gone for a drive in the countryside. (Legate 2003, 155)

Clauses marked with past tense morphology in English can thus receive future (22a), present (22b), or past (22c) counterfactual interpretation.

In Hindi, imperfective (habitual) morphology appears to be required in counterfactual clauses (Iatridou 2009):

(23) agar vo macchlii khaa–**taa** ho–**taa** to use yeh biimaarii nahiiN ho–tii
if he fish eat:**HAB** be–**HAB** then he:DAT this illness NEG be–HAB:F
'If he ate fish, then he would not have this disease.' (Iatridou 2009, 12)

The relation between past and [±realis] cross-linguistically seems to be more complex than in future and present. A number of languages have been reported to have a single (proto-) morpheme for past tense and [-realis]. For instance, Proto-Uto-Aztecan Mood[-realis] and T[past] are reconstructed as a single proto-morpheme (Steele 1975). In an Algonquian language Moose Cree, the morphemes *-pan* and *-htay* have formed a single "preterit paradigm" which has two usages: an imperfective past use and an irrealis modal usage which indicates "that the proposition is unreal or hypothetical as opposed to real and factual" (James 1991, 285). In the closely related Plains Cree language, preterit and irrealis are also reported to be indicated by a single morpheme (Wolfart 1973). A clear connection between past tense morphology and

irrealis morphology has been shown for the Fox language in the Algonquian family as well (Dahlstrom 1995).

It has been proposed that past tense and irrealis are universally related (Iatridou 2000, Legate 2003, Hale 1969; Steele 1975). In the morpho-semantic line of research on this matter, past tense morphology is crucially implicated in the theory of irrealis. The central idea for understanding the so-called "fake past" morphology, i.e. cases when past tense morphology is not used to express temporal relations, is the idea of *remoteness* from the speaker's present reality which can be either temporal or modal. Such an approach suggests that past and irrealis share a feature which forms the basis of post-syntactic insertion of a single morpheme in both contexts. Iatridou (2000) proposes to analyze the past tense morpheme as an exclusion feature (ExclF). Past tense morpheme is taken to be underspecified and can be interpreted either as past tense when it ranges over times or as counterfactual if it spans over worlds (Iatridou 2000, 246):

(24) ExclF = T*(x)* excludes C*(x)*
T(x) stands for ''Topic*(x)*' ' (i.e., "the *x* that we are talking about"). *C(x)* stands for "the *x* that for all we know is the *x* of the speaker."

a. ExclF(t) = the topic time excludes the time of utterance ("the time interval that we are talking about excludes the time interval that for all we know is the time of the speaker").
b. ExclF(w) = the topic worlds exclude the actual world ("the worlds that we are talking about exclude the worlds that for all we know are the worlds of the speaker").

Alternatively, it has been proposed that counterfactual semantics can be derived from a purely temporal past (Ippolito 2002; Arregui 2009).

Taking into account the data in section 2.2 of the current paper which show that verbs in past tense never undergo IC, and assuming analysis of IC as the [+realis] morpheme in the language, I propose that past tense in Arapaho is inherently [-realis] and thus is incompatible with IC. An additional (although indirect) piece of evidence for this claim comes from examples like the following:

(25) wohei c**ii**tei–θiʔ niiinon–eʔ
well enter–3PL tepee–LOC
'Well, they went inside the tepee.' (C&M, 264)

The verb *ciitei3i'* ('to enter') in (25) exhibits [-realis] morphology, i.e. it is not infixed with IC; it is not prefixed for past tense and yet it gets the past tense interpretation[8]. This way of forming past tense is usual and productive among speakers (redacted), and it can receive an explanation if past tense is indeed inherently [-realis] in the language: in Arapaho [-realis] morphology (i.e. no IC) can be used to express past.

Similarly to the analyses proposed in the field for the 'fake past", a wide range of analytical proposals has been offered to explain the use of imperfective in counterfactual clauses. Imperfective has been claimed to occur in irrealis contexts simply because it is a cross-linguistically default aspect (Iatridou 2009); or because perfective is incompatible with counterfactual semantics (Arregui 2004); or because imperfective (like past) contributes to the semantics of irrealis (Ferreira 2011). Finally, there exists a line of analyses proposing that past and imperfective are two language-specific realizations of a single universal irrealis (counterfactual) operator (Bjorkman & Halpert 2013).

Iatridou (2000, 2010) has established a cross-linguistic generalization that imperfective marking (more precisely, habitual marking) is one of the key grammatical ingredients of counterfactuals. Imperfective (habitual) aspect in counterfactuals, similarly to past morphology in languages which employ past to express irrealis, does not give the usual progressive or habitual meaning but rather contributes the counterfactual semantics:

(26) an eperne to farmako tha ginotan kalitera
if take:PAST:**IMP** the.medicine FUT become:PAST:**IMP** better
'If s/he took the medicine, s/he would get better.' (Iatridou 2010, 6)

In this case, we are dealing with "fake imperfective" since examples such as (26) from Greek are not understood as progressive or habitual, and outside of

[8] These data are reminiscent of the so-called *optional past tense* found in a number of languages and discussed, for example, in Bochnak (2015) for Washo and in Cable (2015) for Tlingit. In optional tense languages, there is no presupposition placed on the value of the temporal pronoun, hence morphologically tenseless clauses are predicted to be compatible with past, present, or future time reference. Crucial for understanding the relations between past tense and the category of irrealis in Arapaho is the fact that a morphologically tenseless clause can be compatible with the past tense reading only if it does not undergo IC, i.e. only if it is morphologically [-realis].

counterfactual environment, they would have been marked with perfective morphology.

Without advocating for a particular semantic analysis of the connection between past, imperfective and irrealis, I take these cross-linguistic data to suggest that such a connection exists, and it can be used to support the claim that in Arapaho past and imperfective have the feature [-realis]. The lack of IC in past tense and imperfective aspect can then be explained with an impoverishment rule (19) triggered by the clash of the [+realis] feature in C and the [-realis] feature in T[past] or Asp[imp].

It has been suggested (Calabrese 1995; Noyer 1997) that impoverishment rules result from typologically robust markedness constraints, in other words, impoverishment rules prevent or undo feature clashes or marked feature combinations. In this case, if a derivation results in adjacent conflicting specifications for [±realis] (i.e. [+realis] in C but [-realis] in an adjacent T or Asp head), an impoverishment rule such as (27) can be used as a repair strategy deleting one of the conflicting features:

(27a) [+realis] → Ø / [__ [-realis]]
(27b) *[[+realis] [-realis]]

The language-specific repair of the illicit feature combination (27b) is to delete the [+realis] feature which results in the lack of IC in the context of past tense or imperfective aspect which introduce the [-realis] feature. This analysis then treats past tense and imperfective aspect as a natural class (both of them are inherently [-realis]), and it captures the intervention effects in that the impoverishment rule (27) only applies when the conflicting features are adjacent.

2.3 Interim summary

In this section, I presented the general distribution of the IC morpheme across tenses and aspects in Arapaho. To summarize, patterns of distribution of IC indicate that in Arapaho, there exists a tense- and aspect-based split whereby verbs in present and future tenses and in perfective aspect morphologically mark two contrasts: [±affirmative] and [±realis]; and verbs in simple past and imperfective aspect mark only [±affirmative]:

Table 4. Morphological marking of two contrasts across tenses and aspects

Tense/Aspect	Contrast	
	±realis	**±affirmative**
PRES	Y	Y
FUT	Y	Y
PERF	Y	Y
PAST Simple	N	Y
IMP	N	Y

The major claims of this section were the following. Firstly, based on the contexts of application of IC, I proposed that IC is a morpheme which marks [+realis] in Arapaho. This proposal and the data supporting it will be crucial for the following discussion on the place of IC in the verb structure. In the current section, I also claimed that the [±realis] contrast marked by IC is a contrast separate from the affirmative/non-affirmative agreement paradigms. Finally, I presented the data suggesting that verbs marked with past tense and imperfective (habitual) aspect never undergo IC, i.e. past tense and imperfective do not participate in the [±realis] contrast; the allomorphy observed in these prefixes reflects the AO/NAO contrast.

In the next section, it will be argued that IC is one of the instantiations of the C head: C[+realis]. I will address the details of the syntactic competition between the C[+realis] and a number of C heads with other feature make-ups available in the language.

3. IC and the CP domain

A large number of morphemes on the left edge of the verb forms are in complementary distribution among themselves and with the IC infix. In this section, I will present data and analysis suggesting that all of these elements are competing for a single slot in the structure, namely C^0.

Although in the existing formal literature on the structure of the Algonquian verb surprisingly little attention has been given to IC, it has been proposed that IC results from affixation of a complementizer to the Conjunct verb form in at least some Algonquian languages. This complementizer is also said to be sensitive to realis distinctions in Cree-Montagnais-Naskapi language complex (Brittain 2001).

The current section of this study makes the following claim: IC is analyzed as the spell-out of one of the kinds of C heads in Arapaho – C[+realis].

The focus of this section is a set of the morpho-syntactic environments in which IC does not occur in the language (28). These environments are examined in order to identify the position of the infix in the structure:

(28) subordinate clauses;
interrogative clauses;
wh-questions;
clauses with evidential markers;
subjunctive;
imperative.

The main generalization of this section is the following:

(29) The IC morpheme is in competition for the C^0 position with elements in (28).

The generalization in (29) predicts that all of the elements in (28) are in complementary distribution among themselves and with the IC morpheme. In what follows, I show that this prediction is borne out.

I will present data and analysis which show that some of the elements in (28) are generated in C (such as complementizers and evidential markers), and although others appear on the surface to be generated lower (e.g. *wh*-elements) or higher (e.g. the yes-no interrogative particle *koo*-), they nevertheless compete for the same position via elements associated with them. Three factors/diagnostics will be crucial to determine the position of these elements and their relations to one another:

(30a) all of the elements in (28) are in complementary distribution with one another;
(30b) all of the elements in (28) are in complementary distribution with IC;
(30c) elements in (28) require a special kind of negation, - prefix *cii*, and this requirement will be further explained in subsection 3.4.

The competition between elements in (28) will be modelled in the following terms. The C heads in (31) are in competition. In many cases the C head carrying the features will be phonologically null:

(31) C[+realis]
C[COMP]
C[DUB]
C[+Q, ±Pol]
C[+Q, +wh]
C[SUBJ]
C[IMPER]

The fact that all the items in (31) are in complementary distribution among themselves and with the IC infix will be explained by the structural property in (32):

(32) Only one C head from (31) can be present in a clause at a time, i.e. only one (phonologically overt or null) element can occupy C^0.

The complex distribution of IC arises because IC is a [+realis] morpheme which occupies C, and Arapaho allows only one element in the C head. I will assume that in all types of clauses headed by one of the available C heads (31), features of C are valued via Agree relationship with the relevant element in the clause. In what follows, I discuss each type of the C^0, providing evidence for the generalization in (29).

3.1 Morphemes surfacing in C^0: complementizers and modal elements

I begin the discussion of the relationship between Initial Change and the CP level by presenting two kinds of structural elements which surface directly in the C^0 position: complementizers (or subordinators) and modal or dubitative morphemes.

Embedded clauses in Arapaho require the C^0 position to be filled. In adverbial embedded clauses, verbs are obligatorily prefixed with one of the following morphemes:

(33) toh- 'when'/'after' in the past or present;
tih- 'when' in the past;
eiʔi- 'when' with perfective aspect;
eetih- 'in order that, so that';
eecisi- 'while, during (a time)';
ee(ci)si- 'before, while not yet'.

In complement and relative clauses, the first two subordinators from the list in (33) – *tih-* and *toh-* are used as complementizers or as relativizers; *toh-* is used for present tense and future, *tih-* is used for past:

(34a) h<e>eʔinon–einoni **toh**–ʔentoo–n
<IC>know–3PL/2SG **toh**–located.at–2SG
'They know that you are here.' (C&M, 397)

(34b) nih–nóóhow–óʔ **tih**–níhiʔkóóhu–t
PAST.AO–see–1SG/3SG **tih**–run–3SG
'I saw that s/he was running.' (C&M, 397)

(34c) h<e>et–neeni–noo **toh**–niib–eθen
<IC>FUT–be–1SG **toh**–marry–1SG/2SG
'I will be the one who marries you.' (C&M, 397)

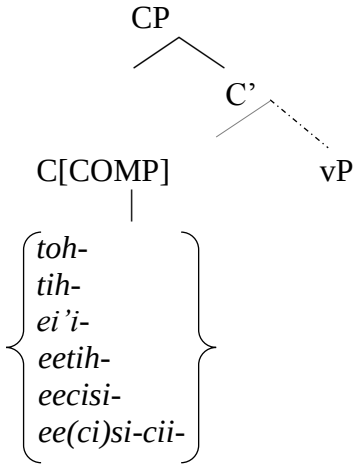
Embedded clauses exhibit a property that will be common for all types of clauses discussed in this section, namely, in negative contexts they require the use of a special negation morpheme: *cii-*:

(35) nih–ʔeʔin–oʔ kookon **toh–**uu–**cii**–neeʔeeneestootiini–ʔ
PAST.AO–know–3SG just.any **since–**IMP–**NEG**–things.people.do–IMPERS:SG
'Then he came to know that one doesn't just do things for no reason.' (CL)

Note that the relevant morphemes (*tih-* and *toh-*) surface higher than aspect (cf. (35) above). The embedded verb never undergoes IC. This is an important point of difference between Arapaho and most of Algonquian where IC is required (or at least possible) precisely in the case of embedding (Brittain 2001, Richards 2004). Importantly, examples (34a-c) once again show that there is no one-to-one relation between AO/NAO and IC. In (34)-(35), embedded verbs are marked with affirmative order of agreement but they do not undergo IC.

I analyze embedded clauses as being headed by C[COMP] with the complementizer (or one of the obligatory subordinators (33)) base-generated in the C[COMP] head:

(36)



The second set of morphemes generated directly in the C head can be broadly called modal or dubitative prefixes:

(37) eebeh- 'if ', 'might'
ibeexu- 'should'
wonoh- 'I wonder if '
wohoeʔ- dubitative

I propose to treat elements in (37) as spell-out of the second kind of the C head available in the language: I will label it C[DUB]. This C head agrees with evidential,

dubitative, and modal elements in a clause. Just like complementizers, the morphemes in (37) surface above tense and aspect (cf. (38) below):

(38a) ne–ihoowu–eʔin **wohóéʔ**–ih–noʔusee
1SG–NEG–know **DUB**–PAST:NAO–arrive
'I don't know if s/he came.' (C&M, 266)

(38b) **wohóéʔ**–hetn–ii–niibéíʔi
DUB–FUT–IMP:NAO–sing
'I wonder if he will sing.' (C&M, 255)

These morphemes are in complementary distribution among themselves and with all the elements in (28) which is expected, given the structural property in (33): C[DUB] is in competition with other C heads in the language (31). As with the C[COMP], the *cii*- negation is required in negative clauses with C[DUB]:

(39a) n–**eebeh**–**cii**–θoowoton–eiʔi
1–**might**–**NEG–**believe–3PL/1SG
'They might not believe me.' (C&M, 254)

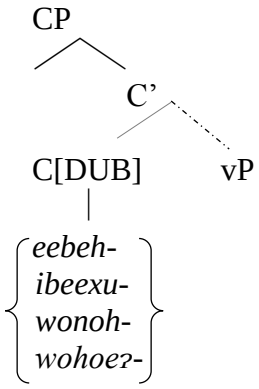
(39b) **wohóéʔ**–ih–**cii**–nóóhob–éíʔi
DUB–PAST:NAO–**NEG–**see–4/3PL
'Maybe he couldn't see them.' (C&M, 254)

As predicted by (32), IC – C[+realis] – never co-occurs with modal prefixes since only one C head (in this case – either C[+realis] or C[DUB]) can be merged at a time.

Modal prefixes presented here are the spell-out of a C with the feature [DUB] (Blain and Déchaine 2007, Waldie 2012)[9]:

[9] It is possible that a more careful analysis of evidentials in the language will show that Arapaho has evidentials belonging to other domains as was proposed by Blain and Déchaine (2007) for a closely related language – Cree. In particular, they show that in Cree, some evidentials are in the CP domain while some others are in the TP domain. Testing this hypothesis for Arapaho and a more detailed discussion of syntax of evidentials are beyond the scope of this paper (but see also Cinque (1999) for a more traditional take on the position of evidentials in the structure; and see Waldie (2012) for data outside of Algonquian supporting the *evidential domain* proposal of Blain and Déchaine (2007)).

(40)



So far I have presented two kinds of C heads in Arapaho: C[COMP] and C[DUB]. In both cases, the C^0 is overtly filled with the relevant morphemes and, by the rule in (32), no other elements from the list in (28) can be present in the CP. In the following sections, I present clauses headed by phonologically null C heads and I show that generalizations discussed in the current section for C[COMP] and C[DUB] hold for the phonologically null C heads (31).

3.2 Phonologically null C heads: Interrogative clauses

In this section, I address two kinds of interrogative clauses in Arapaho: polar questions and *wh*-questions. Yes/no questions are formed in Arapaho with the marker *koo-* which occurs in the left-most position in the verb:

(41) **koo**=he–néetéíh
INTER=2SG–tired
‘Are you (Sg) tired?’ (C&M, 82)

The *koo-* particle is incompatible with IC and is in complementary distribution with all the elements in (28). Interrogative particles have been analyzed in the literature as clause-typing elements belonging to the CP domain (Katz & Postal 1964; Cheng 1991; Bailey 2013). The main idea behind this line of analysis has been that the grammar must have some kind of interrogative feature or morpheme “Q”, which would ensure that questions are interpreted as questions rather than any other clause types. The fact that *koo-* is in complementary distribution with complementizers and relativizers as well as that the *cii-* negation is required in the presence of *koo-* (see (42) below) indicates that *koo-* is licensed in the same position as other elements in (28):

(42) **koo**=he–**cíí**–nokóóyei
INTER=2SG–**NEG**–thirsty
‘Are you (Sg) not thirsty?’ (C&M, 82)

While patterning together with all the elements in (28) in all relevant aspects, the interrogative yes/no particle differs in its surface position from elements occupying the C head. The yes/no question particle surfaces higher than other elements in (28) which is evident from its position with relation to the agreement prefix. Compare the following examples:

(43a) koo=**he**–néetéíh
INTER=**2SG**–tired
‘Are you (Sg) tired?’ (C&M, 82)

(43b) **n**–eebeh–noʔusee
1SG–might–arrive
‘I might come.’ (C&M, 266)

In (43a), the agreement prefix *he-* follows the interrogative yes/no particle, while in (43b), agreement precedes the modal prefix generated in C.

One other point of difference between the *koo-* particle and the elements discussed so far lies in phonology. *koo-* behaves as a phonologically separate element. Compare the form of the future prefix in (44a) and (44b):

(44a) koo=**het**–cii–noʔoosooti
INTER=**FUT**–NEG–rain.arrives
‘Is it not going to rain?’ (CL)

(44b) wohoeʔ–**et**–eiʔiit–owuu niisootoxei–ʔi
DUB–**FUT**–stand.up.to.s.t–3PL be.seven–IMPERS:PL
‘We'll see if they can stand up to it, for seven days.’ (CL)

In (44a), the future prefix has the phonological form that it would get in the beginning of a phonological word[10]: it is epenthesized with an /h/ since the language has a ban on vowel-initial words; in contrast, in (44b), the future prefix is not epenthesized with an /h/ which is the regular non-word-initial form of this prefix in the language. The same holds for agreement prefixes: cf. the form of the 2Sg prefix in

[10] The details and analysis of interaction between phonology and syntactic structure are left for further research. Such research would establish the properties of clitichood active in this language (cf. Selkirk 1996; Talić 2015; Gribanova & Blumenfeld. (to appear) for general discussion of the *minimal* vs. *maximal prosodic word* properties and clitichood).

(43a) above: the /h/-epenthesis occurs in this agreement prefix in the beginning of minimal prosodic words as a repair of the constraint on vowel-initial words.

I propose that both of these points of difference between the *koo-* particle and other elements in (28), namely its position with regard to agreement and its phonological behavior can be explained if we posit that *koo-* is a proclitic rather than a prefix. Following Bošković (2002) in that clitics are syntactically defined as non-branching elements and, hence, cannot be heads and have to be located in the specifier position, I propose that the yes/no particle *koo-* is base-generated in Spec,CP. I assume the higher agreement to be adjoined to the C-head.

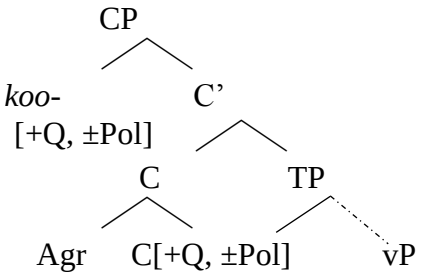
In contrast to the complementizers and evidential markers which occupy the C^0 position, the yes/no proclitic is thus generated in Spec,CP and the C^0 in these clauses is phonologically null. Importantly, in parallel with the clauses where the C head is overtly filled, in the case of the question particle merged in the Spec,CP, it is impossible for any other element to move to or to be merged in the C^0 position. We can assume (following Katz & Postal 1964; Baker 1970; Bailey 2013 a.o.), that a Q element of some sort is required to type a clause as interrogative and that in languages which have overt yes/no question particles, this Q element is in a feature-checking, feature-valuating, or binding relationship with the question particles (Hagstrom 1998; Cable 2008; Endo 2012 a.o.). In these lines of analyses, Q is taken to be an element (a feature, a morpheme or an operator) almost unanimously argued to be in C, or in the relevant (often – left-most) head in the CP domain in the split-CP accounts (Kuong 2008; Ginsburg 2009; Endo 2012 a.o.).

I propose the following analysis for the Arapaho yes/no particle. Adopting the feature make-up of interrogatives detailed in Bailey (2013), I will assume that in polar interrogative clauses the C head carries two semantic features – C[+Q, ±Pol]:

(45) [+Q] – call for an answer
[±Pol] – open polarity, meaning that neither an affirmative, nor a negative answer is presupposed (Bailey 2013, 225).

The question particle *koo-* base-generated in the Specifier of the interrogative C values both of these features on the C head [+Q] [±Pol] which allows for the clause to be interpreted as an open question:

(46)



In the structure in (46) above, *koo-* is generated in the Spec,CP and values the [+Q, ±Pol] features of the head; the phonologically null C[+Q, ±Pol] occupies the head position. Since by (33) only one C^0 can be present at a time, C[+Q, ±Pol] is in complementary distribution with C[COMP] and C[DUB] discussed so far, as well as with C[+realis] (IC) and other kinds of C heads available in the language (30).

A similar analysis can be assumed for the *wh*-questions. *Wh*-questions (or rather *tou*-questions since all of the relevant morphemes begin with *tou-* in Arapaho) are formed with prefixing *wh*-morphemes to a non-affirmative verb form.

Unlike the CP elements discussed so far (complementizer/subordinators, modal prefixes, interrogative particle *koo-*), w*h*-words surface below tense and aspect prefixes:

(47a) hé–**ét–ouθee**–cíí–neyéiθéí
2SG–**FUT–why**–NEG–go.to.school
'Why will you not go to school?' (C&M, 243)

(47b) he–**ii–touθéé**–neyéiθéí
2SG–**IMP:NAO–why**–go.to.school
'Why are you going to school?' (C&M, 243)

Despite the surface difference in the position with the elements discussed so far, *wh*-affixes pattern together with them in the relevant aspects of the distribution: (a) *wh*-morphemes are incompatible with IC just like complementizers/subordinators, modal prefixes and the yes/no-question proclitic; (b) *wh*-marking is in complementary distribution with all the elements in (28), and (c) it requires the *cii*-negation (cf. (47a) above).

In parallel with the analysis for the question proclitic *koo-* outlined in the beginning of this subsection, I will propose that the CP domain in *wh*-questions obligatorily carries the [+Q] feature which makes the interrogative interpretation possible. Unlike the open questions, it is impossible to reply to *wh*-questions with an

affirmative or a non-affirmative answer. In formal terms adopted here, this means that the featural characteristics of the C head in *wh*-questions will differ from those of the interrogative (polar) C head. The C head in *wh*-questions will have the [+wh] feature in place of the [±Pol] feature posited for the interrogative head in polar questions (contrast with (45) above):

(48) [+Q] – call for an answer
[+wh] – questioned element

The idea that the CP domain in *wh*-questions has to carry both a Q element and a *wh*-element traces back to Katz & Postal (1964, 95). Bailey (2013) explicitly states the parallel between the [±Pol] feature which requires checking in polar questions and the [+wh] feature in *wh*-questions: 'Pol contains a variable, which is the questioned element in the same sense that a *wh*-element is the questioned element in a wh-question. In the case of polar questions the variable is simply 'true or not true': open polarity (denoted [±])' (Bailey 2013, 189).

In case of the *wh*-questions, we can assume that the features on C are valued via Agree by a *wh*-word c-commanded by C[+Q, +wh]:

(49) [CP C[+Q, +wh] …[FP **wh-** [+Q, +wh]…]]

Similar to the clauses with the yes/no proclitic, the complementary distribution of *wh*-affixes and all other CP-level elements in (28) is explained if we assume that only one of the available C heads can be present in the structure (32). The phonologically null head C[+Q, +wh] is then in competition with other overt and phonologically null C heads in the language.

3.3 Phonologically null C heads: Subjunctive and Imperative

The last two kinds of C heads in the competition are C[SUBJ] required in Subjunctive clauses and C[IMPER] required in Imperative clauses.

Subjunctive in Arapaho is formed by suffixing *-héhk* (or its allomorphs) to a verb marked with the affirmative order agreement:

(50) betéee–noo–**hók**
dance–1SG–**SUBJ**
'If I dance.' (C&M, 482)

The subjunctive mood is used in the language in (i) future *when* clauses (51a), (ii) in conditional *if* clauses (51b), with verbs of report (51c), and in a number of similar contexts when "doubt is suggested" by the speaker (Cowell & Moss 2008, 291):

(51a) tóót–e–ení–ʔihoo béeθtoo–**néhk**
where–2SG–FUT–go finish–**2SG:SUBJ**
'Where are you going when you finish?' (C&M, 89)

(51b) bíiθ–**néhk** noh h<é>ét–niini núhuʔ heeθéihí–ʔ
eat–**2SG:SUBJ** and <IC>FUT–ADV this how–1PL
'If you eat it, then you will be the way we are.' (C&M, 89)

(51c) n<en>iitóbee-noo hét-niibei-**ʔihók**
<IC>hear.news–1SG FUT–sing–**3SG:SUBJ**
'I hear that he will sing.' (C&M, 89)

Subjunctive suffix is incompatible with IC; it is in complementary distribution with all other elements in (28), and, just like them, it requires the *cii-* negation:

(52) **cii**–biiʔin–owu–nee–**hek** n<e>ehʔ–ei–noo
NEG–find–TRNS–2PL–**SUBJ** <IC>kill–3SG–1SG
'If you don't find it, then he kills me.' (C&M, 359)

The Imperative form in Arapaho is a stem with person and number agreement in the suffixes; there is no special imperative morpheme in the language:

(53a) cebísee
walk
'Walk!' (2Sg) (C&M, 84)

(53b) cebísee–ʔ
walk–PL
'Walk!' (2Pl) (C&M, 84)

Negative imperatives (prohibitive forms) are prefixed with *ciibéh-* which, I speculate, are historically derived from the *cii-* negator and the modal prefix *eebéh-* with the meaning 'may, might'*:*

(54a) **ciibéh**–cebísee
NEG:might–walk
'Don't walk!' (2Sg) (C&M, 84)

(54b) **ciibéh**–cebísee–ʔ
NEG:might–walk–PL
'Don't walk!' (2Pl) (C&M, 84)

We can observe that Subjunctive and Imperative pattern together with all the morpho-syntactic elements in (28) in all relevant respects, and are incompatible with

IC because of the structural competition between the various C heads for the head position. In case of Subjunctive, the [SUBJ] feature on the phonologically null C[SUBJ] is valued via Agree with the Subjunctive suffix. In case of Imperative, the C^0 is occupied with an abstract null element as well – C[IMPER][11]. Both C[SUBJ] and C[IMPER] are subject to the rule in (32) and hence cannot co-occur with any of the elements in (28) requiring licensing by the other C heads available in the language.

The next subsection presents an account of the competition between two kinds of negation in the language, and it explains how the syntactic constructions presented so far are unified by one morpho-syntactic property: they all require the use of *cii*-negation in negative clauses.

3.4 Further evidence for the syntactic competition: Negation

Recall one more time that all of the morphemes in (28) are (a) incompatible with IC; (b) in complementary distribution with one another. In the previous subsections, these empirical facts were taken as evidence of the syntactic competition for the C head position between C heads with different feature make-ups. In what follows, I present the third kind of evidence for the proposed competition; namely, I suggest that the distribution of the two negation morphemes (*cii*- and *hoowu*-) is easily explained if the analysis of the syntactic competition proposed in the previous subsections is assumed.

Two negation morphemes are found in the language – *cii*- and *hoowu*-. Recall from 3-3.3: in the case when negation has to be expressed in the contexts (28), the negative prefix *cii*- must be used and not the negative prefix *hoowu.* Negator *hoowu*-requires the use of NAO of agreement while *cii*- does not require NAO, it can be used with either AO (55a) or NAO (55b-c):

(55a) **hoow**–noʔoθ–biiθihi–**noʔ**, toh**–cii**–noʔoθi–biiθihiini–**θiʔ**
NEG–a.lot–eat–**PL** since–**NEG**–a.lot–eat–**3PL**
'They didn't have much to eat, since they didn't have a lot of food.' (CL)

[11] I should note that in the literature, it is common to assume that both Subjunctive and Imperative have an abstract phonologically null operator in C (Kempchinsky 1986, 2009; Han 1998, 2000).

(55b) hei–touθee–**cíí**–neyéiθéí
2SG–FUT–why–**NEG**–go.to.school
'Why will you not go to school?' (C&M, 243)

(55c) koo=he–**cíí**–nokóóyei
INTER=2SG–**NEG–**thirsty
'Are you (Sg) not thirsty?' (C&M, 82)

The example in (55a) is particularly interesting because it provides a minimal pair for the two kinds of negation where *hoowu-* in the matrix clause requires NAO on the verb, while in the embedded clause the *cii-* negator is used instead without triggering NAO on the verb. In examples (55b-c), however, the *cii-* prefix is used with NAO which shows that this negator is not restricted to either of the agreement orders.

With respect to aspect and tense prefixes, both negators surface lower:

(56a) he–ih–**ʔoow**–noʔkóó
2SG–PAST:NAO–**NEG–**arrive
'You didn't arrive.' (C&M, 242)

(56b) koo=he–ih–**cíí**–niibéi
INTER=2SG–PAST:NAO–**NEG**–sing
'Did you (Sg) not sing?' (C&M, 95)

The selection between two negating morphemes is then not governed by the AO vs. NAO distinction since there is no one-to-one correlation between *cii-* and agreement orders; neither is it governed by the distinction between matrix/independent vs. subordinate clause since *cii-* can be used in either (cf. (55a) vs. (55b)).

As shown in the sections 3.1-3.3, whenever the C^0 position is occupied with an overt or phonologically null element, the *cii-* negation is required. I analyze *cii-* and *hoowu-* as two spell-outs of the same Neg head in the structure. To account for the competition between the two, I propose the following rules:

(57) NEG → cii- / [CP C[*x*] […[NEGP…___...]]]
NEG → hoowu- /
where C[*x*] is any phonologically overt or abstract head of the CP

The rules in (57) state that negation surfaces as *cii-* if it is c-commanded by a C head occupied with any CP domain element available in the language, and it is spelled-out as *hoowu-* elsewhere. To determine the place of the negation in the structure, let us consider negative *wh*-clauses. Both,- negation and *wh*-morphemes surface below tense and aspect (cf. (56) above and (58) below):

(58) he–ih–**touʔ**–noʔkóó
2SG–PAST–**when**–arrive
'When did you arrive?' (C&M, 242)

The crucial examples are like (59) where both negation and a *wh*-element are present:

(59) he–et–ouθee–**cíí**–neyéiθéí
2SG–FUT–why–**NEG**–go.to.school
'Why will you not go to school?' (C&M, 242)

The example in (59) suggests that *wh*-words are higher in the structure than negation. Recall from 3.2 that I take the C head in *wh*- clauses to be comprised of two features C[+Q, +wh] and to be occupied by an abstract phonologically null element. The structure of a negative *wh*- clause will then be the following:

(60) [CP C[+Q, +wh] …[FP **wh-** [+Q, +wh] [NEGP **cii-** …]]]

A *wh*- morpheme merged in the head of FP (and possibly covertly moved to the Spec,CP) will value the [+Q, +wh] features on C^0 and, by (57), Neg will be spelled-out as *cii*- being c-commanded by a C^0 occupied with C[+Q, +wh].

The line of analysis proposed here for the spell-out of *hoowu*- negation vs. *cii*-negation suggests that the incompatibility between *hoowu*- and the morphemes in (28) for instance, the *wh*- elements, is explained by the properties of C in a particular clause (filled vs. not filled) and not simply by a constraint on co-occurrence of the *hoowu*-morpheme and *wh*-morphemes. This account also explains why in some cases *hoowu*- does occur together with the *tou*-morphemes, namely, in clauses where the *wh*-morphemes are not used to form an interrogative clause. Consider (61) where the *tou*-morpheme is used as an NPI rather than a "true" *wh*-question:

(61) he–ihoow–**touθ**–eʔin
2SG–NEG–**what**–know
'You don't know anything.' (CL)

Contrast example in (61) and the *wh*-clause with *cii*- negation in (59). There is a crucial difference in the order of negation and the *tou*-element between the two. In case of the *wh*-use in interrogative clauses (59), the *tou*-morpheme precedes negation. In contrast, in (61), negation precedes the *wh*-element, i.e. the order of the two is reversed. In (61), *wh*- is not generated in the FP, rather it is generated lower, within the VP. It does not require licensing by C[+Q, +wh] since it does not ask for an interrogative interpretation, hence negation is not c-commanded by any overt or

abstract elements in C^0. Since the C head position is not filled, negation must surface as *hoowu-* by (57). The rules in (57) also explain why *hoowu-* is blocked in all the environments in (28). Conversely, *cii-* can only be spelled-out if the C head is filled. These rules then also explain why in sentences like (62b), *cii-* is ungrammatical:

(62a) he–**ihoowú**–neyéiθéí
2SG–**NEG**–go.to.school
'You are not going to school.' (C&M, 242)

(62b) *hei–**cii**–neyéiθéí
2SG–**NEG**–go.to.school
Int: 'You are not going to school.'

4. Summary and Discussion

This paper addresses morpho-syntactic properties of a pervasive process in verbal morphology of Arapaho – Initial Change – and it shows how restrictions on application of this process depend on morphological, syntactic and semantic properties of the verb form. Analysis presented here attempts to explain the patterns of allomorphy observed on the left edge of word-initial verb stems, and in tense and aspect prefixes in Arapaho. In addressing the relationship between agreement orders, clause types, tense, aspect and mood morphology in the language, this paper presents a unified analysis of multiple morpho-syntactic patterns in the language, including the analysis of the IC morpheme, patterns of complementarity between seemingly unrelated morphemes, and competition between two negation prefixes in the language. The novel analysis of the IC infix proposed in this study suggests that two kinds of conditions govern its application. Being one of the possible instantiations of the C head, IC is in morpho-syntactic competition with such elements as complementizers, interrogative markers, wh-prefixes and a number of others. This competition constrains the application of IC in a large number of environments. The second kind of restriction that I argue for in this paper is morpho-semantic, namely that IC is a <Vn> infix marking [+realis] in the language, and it does not get infixed in [-realis] contexts. With respect to the application of IC across tenses and aspects in the language, I present and analyze an interesting tense- and aspect-based asymmetry. Contrary to what has been claimed (Cowell & Moss 2008), I show that allomorphy observed in simple past and in imperfective aspect does not reflect the same contrast

as the process of IC in present and future tenses and in perfective aspect, instead it marks the contrast between Affirmative and Non-Affirmative agreement. This account explains otherwise unexplained differences in distribution of past tense and imperfective aspect allomorphs and presence or absence of IC in present and future tenses and in perfective aspect.

I have shown that a number of CP-domain elements in Arapaho are in complementary distribution among themselves and with the morpheme in question – IC infix. It is worth noting that the list of elements that are competing for the C position in the language includes only the elements that have cross-linguistically been tied to the CP domain: these elements are responsible for complementation/subordination (COMP); mood properties of the clause: IC, Subjunctive, Imperative, modals (MOOD), or for the clause-typing: interrogative elements (CT):

(63) CP = {COMP, MOOD, CT}

Complementarity is often taken in the theory to be a criterion for identity (see for example Ritter & Wiltschko 2010 for discussion). However, it has also been shown that morphemes which occur in complementary distribution do not necessarily occupy the same morpheme slot (Noyer 1997). Given the data and analysis presented in the previous sections, I propose that the morphemes analyzed in this paper are in complementary distribution because they require licensing by C heads with different feature make-up, and these C heads are in competition (see (31) repeated below as (64)):

(64) C[+realis]
C[COMP]
C[DUB]
C[+Q, ±Pol]
C[+Q, +wh]
C[SUBJ]
C[IMPER]

Importantly, I claim that there is only one head in the CP domain in Arapaho, and this structural constraint produces the competition between elements in (64). Bobaljik & Thráinsson (1998) have shown that morphemes can compete for being attached to the verb whereby the competition is driven by the structural properties of the verbal morphology in the language rather than by specific features expressed by the

morphemes in question. Extending their proposal to the CP domain, in the case of Arapaho, this means that the C head is a host of a number of (bundles of) features, each of which will only be merged in the appropriate syntactic and semantic context. In other words, Arapaho is a *simple CP* language.

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