

In an imperfect world: deriving the typology of counterfactual marking*

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1 Introduction

Counterfactual conditionals (CFs) in many languages are marked by “fake” temporal inflection: tense or aspect markers that do not contribute their standard temporal meanings but instead seem to be necessary for a CF interpretation. The two types of temporal morphology that have been widely documented as playing a role in CFs are *past tense* and *imperfective aspect* (e.g. Anderson, 1951; Hale, 1969; Isard, 1974; Steele, 1975; Lyons, 1977; James, 1982; Palmer, 1986; Fleischman, 1989; Iatridou, 2000; Van Linden and Verstraete, 2008):

- (1) English: CF marked by **past**
 - a. If I **knew** the answer **now**, I would tell you.
 - b. If I **left tomorrow**, I would arrive next week.¹

- (2) Greek: CF marked by **past imperfective**
 - a. An efeyes avrio θa eftanes eki tin ali evdomada
if leave.PST.**impf** tomorrow FUT arrive.PST.IMPF there the other week
'If you left tomorrow, you would get there next week.'
 - b. *An efyes avrio θa eftases tin ali evdomada
if leave.PST.**pfv** tomorrow FUT arrive.PST.PFV the other week

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¹This example is technically not a counterfactual conditional, but a **future less vivid** (FLV). These future-oriented conditionals share morphological and syntactic properties with true counterfactuals, and the two will be treated together here.

(Iatridou, 2000, ex. (21))

Such patterns raise the question of how these particular morphemes are able to mark counterfactuality. Until recently, it was assumed that languages that use a fake imperfective in CF marking are a subset of those languages that use a fake past – and that past and imperfective are the only temporal markers to be used in CF marking (see, e.g. Iatridou, 2009, for a typological summary). In this chapter, we build on our previous research to broaden the typology of temporal marking in CFs (Bjorkman and Halpert, 2012; Halpert and Karawani, 2012).

Though our expanded typological picture introduces additional patterns that must be accommodated by the theory of temporal marking in CFs, we argue that the result is in fact a *simpler* profile: all languages that employ a temporal CF strategy use a *single* temporal CF operator:² either past tense *or* imperfective aspect. We argue that all cases where multiple temporal specifications appear to be involved in CF marking are illusory, arising out of syntactic underspecification for temporal morphology that may appear to convey complex meanings.

The broader typology that we propose is summarized in (3):

(3) **Broader temporal CF typology: 2 main types of languages**

1. **Past CF languages:** require past tense – and nothing else – as a CF marker.

3 subtypes:

- (a) Languages that *appear* to also require imperfective
(Iatridou, 2000; Arregui, 2009; Ippolito, 2004)
- (b) Languages that *appear* to also require perfective
(Halpert and Karawani, 2012; Karawani and Zeijlstra, 2010)
- (c) Languages that allow *either* perfective or imperfective.
(Iatridou, 2009)

2. **Imperfective CF languages:** require imperfective aspect as a CF marker – and nothing else.

2 subtypes:

²For the purposes of this study, we focus only on CFs marked by otherwise temporal morphology, setting aside other components, such as subjunctive mood or specialized CF complementizers, that may also be required. We also focus on the morphological marking in the antecedent clause of CFs: though many languages employ identical temporal marking in both antecedent and consequent clauses, some languages show different marking in these two contexts. We set aside for the moment, for example, the presence of future morphology in the consequent of CFs in many languages (e.g. English *would*).

- (a) Languages that *appear* to also require past tense.
- (b) Languages that *do not appear* to require past tense.

The remainder of this chapter is organized as follows: in section 2, we discuss some earlier approaches to temporally-marked CFs and briefly introduce the concept of temporal underspecification, which will be crucial to how we organize our typology of temporal CFs. Then, in section 3, we turn to the past CF languages, which have formed the basis of much previous work on the typology of temporal CF marking. We show that despite a variety of apparent aspectual specifications, these languages all share a requirement for a syntactically specified past in CFs. We argue from independent evidence that all apparent aspectual requirements in these languages are in fact an illusion. In section 4, we turn to a second set of languages, those that share *imperfective* as a common component in CF marking. We argue that in these languages, the imperfective aspect is the necessary ingredient to yield a CF meaning, and that any apparent requirement for (past) tense is illusory. In section 5, we return to the question of how these morphemes yield CF meanings. We show that the new, expanded typology provides a powerful metric to evaluate existing proposals regarding the use of temporal morphemes in CFs. Finally, in section 6, we present our conclusions.

2 Background: Morphological Marking in CFs

As mentioned in the introduction, many languages mark counterfactual conditionals with morphology that in other contexts conveys purely temporal meanings. Tense and aspect marking in CFs that does not seem to result in its ordinary temporal interpretation has been called “fake” to distinguish it from its typical temporal use (Iatridou, 2000).

Fake *past* morphology has been well-documented and widely investigated (Anderson, 1951; Hale, 1969; Steele, 1975; James, 1982; Palmer, 1986; Fleischman, 1989; Iatridou, 2000; Van Linden and Verstraete, 2008, a.o.). A number of authors have argued that fake past is the *locus* of CF semantics. Some have proposed that what we call “past” simply marks a more abstract category of *remoteness*, which can be either temporal or modal (Steele, 1975; Iatridou, 2000; Ritter and Wiltschko, 2010), while others have proposed that CF meaning can be derived from a purely temporal past (Ippolito, 2002; Arregui, 2009).

Fake *imperfective* in CFs has also been reported (Iatridou, 2000, 2009; Van Linden and Verstraete, 2008). In contrast to fake tense, however, this fake aspect has received much less attention, and its role in CFs is much less well understood. It has been argued that imperfective occurs in CFs simply because it is a cross-linguistically *default* aspect (Iatridou, 2009); because *perfective* is incompatible with CFs (Arregui, 2004); or because imperfective (like past) contributes to the semantics of CFs (Ferreira, 2011). All of these claims rest on

the assumption that when fake aspect occurs in CFs, it is always *imperfective*. Following Iatridou (2000), Arregui and Ippolito assume that in languages that mark CFs with fake past, if any aspect appears in CFs, it is fake imperfective. While Iatridou (2009) observes that some languages (e.g. Russian, Polish) allow *real* aspect in CFs, she maintains that all “fake” in CFs is imperfective.

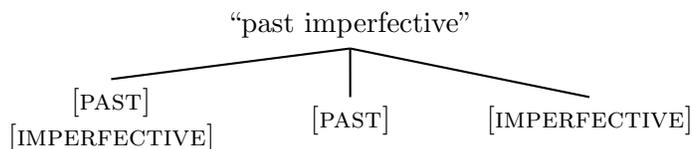
More recent work on the morphological marking of CFs, however, has shown that the full cross-linguistic typology includes languages with fake *perfective* aspect in CFs. In this chapter, we not only incorporate these languages into the typology of temporal CF marking, we also introduce languages that mark CFs with imperfective aspect *independently*, without any use of past tense. As we discuss in section 5, this typology motivates a new approach to aspectual morphology in CFs.

2.1 Syntactic underspecification of temporal morphology

We argue in this paper that despite diverse surface patterns in temporal CF marking, all temporal marking in CFs arises from a *single* CF operator, which can be realized as either (past) tense *or* (imperfective) aspect. We therefore must provide some account of the fact that some languages do appear to require specific tense *and* aspect morphology in CF contexts.

We propose that an illusion that both tense *and* aspect are required to compose a CF meaning in certain languages arises when temporal morphology is underspecified for either tense or aspect. In other words, a morpheme that tends to yield a complex meaning, e.g., “past imperfective” could be specified for both tense and aspect, but may be specified for only one of these categories. (4) illustrates three different underlying specifications that could be associated with morpheme that occurs in contexts with a “past imperfective” meaning:

(4) Possible syntactic specifications for a “past imperfective” morpheme



An accurate typology of temporal marking in CFs, then, requires that all complex temporal morphology be examined to determine its syntactic specification. The remaining sections of this paper demonstrate that such examination reveals that in every case where CFs have been described as requiring both a particular tense and a particular aspect, closer

examination reveals that the relevant morphology is in fact specified for only one or the other.

3 Past CF languages

The apparent puzzle of fake imperfective – the question of why imperfective aspect must sometimes appear in CFs *in addition to* fake past – has arisen largely on the basis of CF marking in Greek and the Romance languages. In these languages, CFs are always marked with complex past-imperfective morphology. The “real” temporal interpretation of the sentence is not morphologically expressed.

(5) **French CFs: past imperfective (no real tense/aspect)**

- a. Si Pierre partait demain, il arriverait là-bas le lendemain
if Pierre left.PAST.**impf** tomorrow he would arrive there the next.day
‘If Pierre left tomorrow, he would arrive there the next day.’
- b. *Si Pierre est parti demain, il serait arrivé là-bas le lendemain
if Pierre is left.**pfv** tomorrow he would-arrive there the next.day

The suppression of “real” perfective aspect in favor of the imperfective in these CF forms leads to the conclusion that the imperfective is directly implicated in CFs. In a broader typology, however, this direct association between CF and imperfective breaks down.

In Zulu, for example, we find that CFs are marked by the past imperfective morpheme *be-* (6a), but that the *perfective* suffix *-ile* is also possible in perfectly-interpreted CFs (6b) (Halpert and Karawani, 2012). In other words, we learn from Zulu that while imperfective may be implicated in CFs, it is not the case that it arises solely because perfective is *incompatible* with CF contexts.

(6) **Zulu CFs: past imperfective required (real perfective possible)**

- a. [ukuba **be-** ngi- gula] be-gi-zo-thimula
if PAST.IMPF- 1SG- be.sick IMPF-1SG-FUT-sneeze
‘If I had been sick, I would have sneezed.’
- b. [ukuba **be-** ngi- thimul- **ile**] be-ngi-zo-dinga ithishi
if PAST.IMPF- 1SG- sneeze- PFV IMPF-1SG-FUT-need 5tissue
‘If I had sneezed, I would have needed a tissue.’ (HK 2012, ex. (5))

This conclusion is pushed even further when we examine Palestinian Arabic (PA). In PA we find that past-*perfective* morphology marks CFs (7a) – though “real” aspectual morphology can also appear in imperfectively-interpreted CFs. In other words, PA appears to be the

reverse of Zulu: both allow “real” aspect to appear in addition to the required CF “fake” aspect, but the CF aspect required in Zulu is imperfective, while the CF aspect in PA is perfective:

(7) **Palestinian Arabic CFs: past perfective (real imperfective possible)**

- a. [iza **ʔileʕ** halaʔ,] kaan b-iwsal ʕal waʔt la
 if leave.**past.pfv** now, be.PAST.PFV B-arrive.IMPV on the-time for
 l-muħaadara
 the-lecture
 ‘If he left now, he would arrive on time for the lecture.’ (Halpert and
 Karawani, 2011, ex. (6a))
- b. [iza **kanno** **b-yitlaʕ** bakkeer kul yom,] kaan
 if be.**past.pfv** B-leave.**impf** early every day, be.PAST.PFV
 b-iwsal ʕa l-waʔt la l-muħadaraat
 B-arrive.IMPV on the-time to the-lectures
 ‘If he were in the habit of leaving early, he would arrive to the lectures on time.’
 (Halpert and Karawani, 2011, ex. (19a))

The clearest indication that fake aspect in CFs does not depend on cross-linguistic properties of particular aspectual specifications comes from Russian. In Russian (and other Slavic languages), past-marked CFs allow *both* imperfective and perfective, corresponding to the “real” aspectual interpretation of the sentence (Iatridou, 2009):

(8) **Russian CFs: past (real aspect possible)**

- a. Esli by Džon umer, my poxoroni-l-i by ego na
 if SUBJ John die.**pfv.pst** we bury.PFV-PST-PL SUBJ he.ACC on
 gor-e.
 mountain-LOC
 ‘If John died, we would bury him on the mountain.’
- b. Esli by Džon umira-l, s nim by-l by doktor.
 if SUBJ John die.**impf-pst** with he.INSTR be-PST SUBJ doctor
 ‘If John were dying, the doctor would be with him.’ (Sergei Tatevosov, p.c.)

The common thread across these four different patterns – suppression of real aspect in favor of fake imperfective, appearance of fake imperfective in addition to real aspect, appearance of fake perfective in addition to real aspect, and appearance of real aspect only – is the appearance of fake past tense. We argue in this section for such a unified approach to all of these languages: we propose that they all mark CFs with a syntactically specified PAST – and *only* PAST.

The apparent requirement for a particular aspectual marking in CFs that emerges in some of these languages is illusory. It arises simply because the “fake” aspectual value is unspecified in the temporal morphology of the language.

Our argument proceeds in three parts. First, we return to the simple cases, illustrated by Russian, where tense and aspect are clearly morphologically distinct. In these cases, it is surface apparent that only PAST is required in CFs. Second, we turn to a more complex case, arguing that “past perfective” morphology is in fact underspecified for aspect in PA. Finally, we extend this underspecification analysis to the languages that were originally noted to require a fake “past imperfective.” We argue that in languages like French, “past imperfective” morphology is similarly underspecified for aspect.

3.1 Simple cases: morphologically distinct tense and aspect

We have already seen that languages like Russian show full aspectual contrasts in CFs, as repeated below in (9):

- (9) a. Esli by Džon umer, my poxoroni-l-i by ego na
 if SUBJ John die.**pfv.pst** we bury.PFV-PST-PL SUBJ he.ACC on
 gor-e.
 mountain-LOC
 ‘If John died, we would bury him on the mountain.’
- b. Esli by Džon umira-l, s nim by-l by doktor.
 if SUBJ John die.**impf-pst** with he.INSTR be-PST SUBJ doctor
 ‘If John were dying, the doctor would be with him.’ (Sergei Tatevosov, p.c.)

In (9), past tense morphology appears in both CF constructions, though neither receives a past tense *interpretation* (the first is future-oriented, while the second is a present CF), an indication that the past in these constructions is “fake”. The aspect that each bears, however, does correspond to the actual aspectual interpretation of the antecedent. This pattern is what we expect for *all* languages, if PAST tense is the only temporal operator required in CFs. We propose that this ability to mark real aspect in CFs in languages like Russian arises from the morphological independence of tense and aspect morphology. Aspectual contrasts in Russian are determined by a system of affixes, distinct from the realization of tense morphology.

We find a similar independence in Zulu temporal morphology. Past-marked CFs in Zulu require the prefix *be-*, which is traditionally described as a “past imperfective” morpheme:

- (10) [ukuba **be**-ngi-gula] be-gi-zo-thimula
 if **impf**-1SG-be.sick IMPF-1SG-FUT-sneeze

“If I had been sick, I would have sneezed.”

This “past imperfective” morphology is generally in opposition to a “past perfective” suffix, *-ile*. These two affixes are typically in complementary distribution, as (11) illustrates:

- (11) *Be- ngi- thimul- ile izolo.
PAST.IMPF- 1SG- sneeze- PFV yesterday
intended meaning: “I sneezed yesterday.” (HK 2012, ex. (19a))

In CFs, however, Zulu does allow these morphemes to co-occur. Specifically, as we see in (12), a CF with a *perfective* interpretation includes both the “past imperfective” prefix and “past perfective” suffix:

- (12) [ukuba **be-** ngi- thimul- **ile**] be-ngi-zo-dinga ithishi
if PAST.IMPF- 1SG- sneeze- PFV IMPF-1SG-FUT-need 5tissue
‘If I had sneezed, I would have needed a tissue.’ (HK 2012, ex. (5))

If both of these morphemes were in fact specified for past tense, we might expect Zulu to look like Russian, with either one able to mark CFs. It appears, however, that *neither* of these morphemes is fully specified: Bjorkman and Halpert (2012); Halpert and Karawani (2012) conclude that the “past imperfective” morpheme in Zulu is specified only for PAST tense, while Botne and Kerchner (2000) suggest that the “past perfective” suffix is merely a perfective marker.³ Indeed, just as the “past imperfective” morpheme can correspond with non-imperfective interpretations in CFs in Zulu, the “past perfective” can correspond to non-past interpretations with verbs of instantaneous action:

- (13) ngi- shabal- ele manje
1SG- disappear- **pfv** now
“I disappear now.” (HK 2012, ex. (17a))

Like Russian, then, Zulu allows “real” aspect to appear on CF verbs in addition to fake CF past. Unlike Russian, which has a full complement of temporal morphemes, Zulu has two underspecified morphemes: PAST and PERFECTIVE. Since perfective verbs typically receive a default past tense interpretation across languages (Dahl, 1985), the PERFECTIVE morpheme is associated with a “past perfective” meaning, in turn giving rise to the association of “imperfective” interpretations with the PAST morpheme, in the absence of PERFECTIVE. The systems of temporal morphology for both languages is summarized below in (14):

³It is generally true that perfective aspect has a default past interpretation (Dahl, 1985) – though in languages like Russian the (morphological) “present perfective” has a *future* interpretation)

(14)

	<i>description</i>	<i>syntax</i>		<i>marks CFs?</i>
		<i>tense</i>	<i>aspect</i>	
Russian	“past”	PAST	(IMPF/PFV)	yes
Zulu	“past imperfective”	PAST	∅	yes
	“past perfective”	∅	PFV	no

3.2 A more complex case

In the previous subsection, we saw how in languages like Russian, with fully distinct tense and aspect morphology, only tense is implicated in CF marking. We also saw the role that temporal *underspecification* can play: in a language like Zulu, an underspecified PAST morpheme gives rise to the illusion of a fully-specified “past imperfective”. When this morpheme is used to mark CFs, however, we see that just as in Russian, it can combine with (underspecified) PERFECTIVE aspect.

In this section, we’ll turn to a somewhat different case of underspecification: that of Palestinian Arabic (PA). We’ll show that PA marks CFs with an underspecified PAST morpheme that yields a “past *perfective*” interpretation, in opposition to an underspecified IMPERFECTIVE morpheme (Halpert and Karawani, 2012; Bjorkman and Halpert, 2012).

As we have already seen, PA requires “past perfective” morphology in CFs:

- (15) [iza **ʔileʔ** halaʔ,] kaan b-iwsal ʔal waʔt la
 if leave.PAST.**pfv** now, be.PAST.PFV B-arrive.IMPF on the-time for
 l-muħaadara
 the-lecture
 ‘If he left now, he would arrive on time for the lecture.’ (HK 2012, ex. (6a))

Just as we saw in Zulu, PA can also express real aspect in CFs,⁴ in which case fake CF past is marked via the auxiliary *kaan*. In these constructions, the auxiliary *kaan* is always inflected as though it were *perfective* while the main verb bears real aspectual morphology.

- (16) [iza **kanno** **b-yitlaʔ** bakkeer kul yom,] kaan b-iwsal
 if be.**past.pfv** B-leave.**impf** early every day, be.PAST.PFV B-arrive.IMPF
 ʔa l-waʔt la l-muħadaraat
 on the-time to the-lectures
 ‘If he were in the habit of leaving early, he would arrive to the lectures on time.’
 (HK 2012, ex. (19a))

⁴PA can also mark real (non-CF) tense, by using a second instance of auxiliary *kaan*.

In PA, then it is *perfective*, rather than imperfective, that appears to be required in all CF constructions, in addition to the past. PA is thus notable for the fact that the aspect implicated in past-marked CFs is not imperfective – contradicting the claims of authors such as Iatridou (2000, 2009) and Van Linden and Verstraete (2008), discussed earlier, that fake aspect in CFs is always imperfective.

Building on previous work (Halpert and Karawani, 2012; Bjorkman and Halpert, 2012), we take the same approach to PA as we did to Zulu – and Russian – in the previous subsection: CFs in PA are marked by PAST alone. In contrast to a language like Zulu, however, in PA it is *perfective* aspect that is illusory in past contexts: “past perfective” morphology in PA corresponds to a simple [PAST] specification. The perfective interpretation arises only from the absence of the separate IMPERFECTIVE morphology in the syntax.

Karawani and Zeijlstra (2010) argue that “past perfective” morphology in PA corresponds simply to a tense operator, and contains no aspectual specification. Bjorkman (2011) makes a similar claim about the “past perfective” across multiple varieties of arabic, based on patterns of auxiliary use. One way in which we can observe this underspecification is in the inflection on the past auxiliary *kaan* itself. Though Arabic languages have a simple past perfective form of the verb, they generally require an auxiliary to form the past imperfective (the reverse of the Romance situation). The form of this auxiliary (*kaan* ‘be’) in PA is morphologically *perfective*, as illustrated in (17), despite the fact that there is no perfective meaning conveyed in such past imperfective clauses (Halpert and Karawani, 2012).

- (17) *kaanat* *tuktub*
 be.PAST.pfv write.IMPF
 ‘She used to write.’ (Halpert and Karawani, 2012, ex. (12a))

Standing in opposition to this PAST morpheme that typically receives a “past perfective” interpretation in PA is an IMPERFECTIVE morpheme that is underspecified for tense. Benmamoun (2000) claims that present imperfective predicates, which receive no independent tense morphology, behave as if no tense is present in several varieties of Arabic.⁵ If PAST is the crucial ingredient for CF marking in PA, then it is unsurprising that imperfective morphology, which is not associated with past tense, is not implicated in CF constructions.

In the next section, we will see how this type of underspecification approach required for PA can be extended to account for the original puzzle of fake imperfective in Greek and Romance CFs.

⁵Specifically, Benmamoun (2000) argues that present imperfective verbs in Arabic do not raise to T, citing as evidence their interaction with negation and preference for SVO word order. Based on the absence of movement to T, Benmamoun argues that present tense features are not syntactically active.

3.3 Extending the underspecification analysis

Recall the puzzle of fake imperfective marking in CFs that we saw at the start of this chapter:

- (18) **French CFs: past imperfective (no real tense/aspect)**
- a. Si Pierre partait demain, il arriverait là-bas le lendemain
if Pierre left.PAST.**impf** tomorrow he would arrive there the next.day
'If Pierre left tomorrow, he would arrive there the next day.'
 - b. *Si Pierre est parti demain, il serait arrivé là-bas le lendemain
if Pierre is left.PAST.**pfv** tomorrow he would-arrive there the next.day

This puzzle arises from the assumption that all temporal morphology in languages like French and Greek is fully specified for both tense and aspect. Note, however, that just as in Zulu and PA – and unlike in Russian – French uses a single form, rather than two separate morphemes, to convey “past imperfective.” We argue that this complex meaning does not stem from fully specified PAST IMPERFECTIVE morphology, but rather from an *underspecified* PAST morpheme, just as in Zulu. The imperfective interpretation here arises due to the opposition between underspecified PAST and PERFECTIVE morphemes, both of which typically receive a past interpretation.

Just as in Zulu and PA, evidence for this approach comes from the occurrence of “past imperfective” morphology in contexts where we would expect either *perfective* aspect or no aspect at all. In French, the pluperfect (“past perfect”) construction provides just such a context. The auxiliaries that appear in the pluperfect standardly bear “past imperfective” morphology, as shown in (19):

- (19) **French pluperfects: perfective interpretation, “imperfective” auxiliary**
- a. Les élèves avaient étudié.
The students have.PAST.**impf** study.PTCP
“The students had studied.”
 - b. L'hiver était arrivé
The-winter be.PAST.**impf** come.PTCP
“Winter had come.”

Crucially, these constructions receive a *perfective* interpretation, despite the appearance of “past *imperfective*” morphology. This pattern suggests that the morphological imperfective comes “for free” with past tense morphology.⁶

⁶The literary *passé antérieur* (*les élèves eurent étudié*), and the *passé surcomposé* (*les élèves ont eu étudié*) in French do involve apparently perfective auxiliaries. These forms, however, are limited to temporal

We are now in a position to understand the difference in CF strategies between French and PA: while each language has a single specified aspect that stands in opposition to specified PAST, the specified aspect is PERFECTIVE in French and IMPERFECTIVE in PA. The temporal specification of French *matches* that of Zulu, with the crucial difference that Zulu (like PA) has a grammatical strategy to realize real (specified) aspect in CFs – in addition to CF PAST morphology – while French does not.

3.4 Interim summary

The following table summarizes the claims of this section:

(20)

	<i>description</i>	<i>syntax</i>		<i>marks CFs?</i>
		<i>tense</i>	<i>aspect</i>	
Russian	“past”	PAST	(+IMPF/PFV)	yes
Zulu & French	“past imperfective”	PAST	∅	yes
	“past perfective”	∅ ⁷	PFV	no
Palestinian Arabic	“past imperfective”	∅	IMPF	no
	“past perfective”	PAST	∅	yes

This is a simplified typology of the temporal marking seen in CFs thus far: in all of these languages, despite the variation in surface *interpretation* of temporal morphology, only PAST tense is required to mark CFs. Aspect is implicated in CF marking only to the extent that certain tense morphemes may be *underspecified* for aspect while being associated with a canonical aspectual interpretation. By investigating the actual syntactic specifications of temporal morphology in these languages, we can show that even when particular aspectual *meanings* appear to co-occur with the required PAST tense, this aspect is not actually specified in the syntax.

4 Imperfective CF languages

In the previous section, we saw a number of languages in which a PAST morpheme was implicated in the marking of CFs. In all of the languages, we discovered that true, specified aspect was *never* implicated, even in cases when morphology that typically corresponded with a particular aspect was required. Even though, as we demonstrated in the previous

adjuncts: consequently, we argue such auxiliaries could receive perfective features from a higher syntactic source, unlike the morphologically “imperfective” auxiliaries in (19).

⁷Given the present tense form of the “past perfective” auxiliary in many Romance languages, it may be that the “past perfective” is actually syntactically specified for present tense, rather than no tense at all.

section, we are able to factor out aspect as a possible ingredient in CFs in those languages, nothing in what we have seen rules out the possibility that some languages could use true syntactic aspectual marking in CFs.

In this section, we address this issue. We show that we *do* find languages that require syntactically specified aspect in CFs, but we argue that in these languages fake aspect *alone* is implicated in CF marking – and not tense. Strikingly, in the languages that we have found thus far in this category, it is *imperfective* aspect that is used as a CF marker.

Just as in the past CF languages, in these languages we will see variation in *surface* aspectual interpretations, which can mask uniformity of aspectual specification. First we will see that in Hindi, which like Russian has separate, fully specified tense and aspect morphology, aspect *alone* is used in CFs. Then we will turn to Persian, which appears to use imperfective aspect in conjunction with past tense in CFs.

4.1 Hindi: imperfective aspect, no apparent past tense

In Hindi, CFs are marked using *habitual* morphology, with no apparent past tense:

- (21) a. Agar vo macchlii khaa-taa ho-**taa**, to use yeh biimaarii nahiiN
 if he fish eat-HAB be-**hab** then he.DAT this illness NEG
 ho-tii
 be-HAB.FEM
 ‘If he ate fish (on a regular basis), then he would not have this disease.’
- b. Agar vo gaa rahaa ho-**taa**, to log wah wah kar rahe ho-te
 if he sing PROG be-**hab** then people wow wow do PROG be-HAB
 ‘If he were singing, people would be going ‘wow wow’.’ (Iatridou 2009, (15), (12))

As Iatridou (2009) and Bhatt (1997) discuss, the habitual marker *-taa* appears in all CF constructions in Hindi. This morpheme is clearly specified for aspect but not for tense: outside of CF conditionals, *-taa* must co-occur with either a past or present tense auxiliary:

- (22) a. Ram roj ghar jaa-**taa** hai
 Ram every.day home go-HAB PRES
 ‘Ram goes home every day.’
- b. Ram roj ghar jaa-**taa** thaa
 Ram every.day home go-HAB PST
 ‘Ram used to go home every day.’
- c. *Ram roj ghar jaa-**taa**
 Ram every.day home go-HAB

(Bhatt 1997, ex., (11d))

Iatridou (2009), following Bhatt (1997), assumes that Hindi is a language that requires (a covert) fake past in CFs, but as the data above show, it is not clear that this is the case. Rather, Hindi seems to be a language like Russian, where tense and aspect are fully independent and realized using separate morphemes. There is therefore no morphological correspondent to a past tense operator, and no independent means of motivating a covert operator. It appears, then, that Hindi is a language that marks CFs with imperfective (habitual) aspect alone.

4.2 Persian: imperfective aspect, illusory past tense

In **Persian**, CFs are marked with imperfective verbal prefix *mi-* (Iatridou 2009, data p.c. from Arsalan Kahnemuyipour):

- (23) a. age fardaa **mi**-raft hafte-ye ba'd **mi**-resid
if tomorrow DUR-go.PAST week-EZ next DUR-arrive.PAST
“If he left tomorrow, he would arrive next week.”
- b. age alaan javaab-e so'aal-o **mi**-dunest-am, xeyli eftexaar
If now answer-EZ question-acc. DUR-know.PAST-1SG, a lot pride
mi-kard-am
DUR-do.PAST-1SG
“If I knew the answer now, I would be very proud (lit.: take pride a lot)”

This morphology also occurs in non-counterfactual imperfectives and appears to be independent of any particular tense interpretation:

- (24) a. man har ruz raah **mi**-rav-am
I every day path DUR-go.NONPST-1sg
“I walk every day”
- b. man daar-am raah **mi**-rav-am
I have-1sg path DUR-go.NONPST-1sg
“I am walking (now)”

While Hindi showed no evidence of [PAST] morphology in CFs, Persian does appear to implicate past tense in CF marking. In particular, Persian requires the so-called “past stem” form of the verb in CFs (23). It is clear, however, that this form of the stem is *not* generally required with imperfective morphology, as the non-CF forms in (24) above, which involve a “nonpast stem” illustrate.

Based on this pattern, we could draw two possible conclusions about Persian. First, the use of the “past stem” in CFs might suggest that Persian is a language in which CFs require *both* PAST *and* syntactically specified (non-illusory) IMPERFECTIVE morphology, as has been previously assumed about languages like French. On the other hand, just as we saw *illusory aspect* in Past CF languages like French, it could be that the “pastness” of the “past stem” here may also be illusory.

Though more work is needed on these temporal patterns in Persian CFs, we will here note some preliminary evidence that the “past” in these constructions is indeed illusory. Specifically, we find that the “past” stem does occur in some limited non-past contexts in Persian. One such instance is the “formal future” form in (25):

(25) **“Past stem” in formal future form**

- a. Sârâ daru-hâ-yaš râ xâh-ad xord
 S. medicine-PL her-ACC want.3SG eat.PAST
 “Sârâ will have her medicine.” (Taleghani 2008, ex. (30))
- b. xâh-am raft
 want-1SG go.PAST
 ‘I will go.’ (Maziar Toosarvandani, p.c.)

In addition to the formal future, we also find colloquial constructions where a simple past-stem can receive a prospective (non-past) interpretation, as in (26):

(26) **“Past stem” with prospective interpretation (colloquial Farsi)**

- a. raft-am
 go.PAST-1SG
 ‘I went’ / ‘I’m about to go.’ (Maziar Toosarvandani, p.c.)

In these constructions, a “past stem” of the main verb combines with an agreement-bearing “want”, yielding a future interpretation. While in PA and French, we saw morphological aspect appear on auxiliary forms that clashed with the actual aspectual interpretation, here we find a similar circumstance where the tense on the main verb clashes with the actual tense interpretation of the construction. The use of the “past” stem in these contexts thus suggests that this stem may not actually convey syntactic [PAST] tense.

A question that emerges from all of these unusual instances of the past stem – including CFs, formal future, and colloquial prospective – is *why* the past stem is required in these situations. In particular, we are faced with the following puzzle about CFs: even if the so-called “past” stem does not in fact encode syntactic PAST, some factor must still account for its necessity in CF conditionals. It is possible that the explanation lies in the use of “past” stems in conditional constructions more generally (Toosarvandani, p.c.), or in

whatever conditions its use in the future contexts, though this remains a question for future research.

4.3 Interim summary and typological update

In this section, we have expanded the typology of temporal marking in CFs. In addition to the languages that require syntactically specified PAST to mark CFs, which we saw in the previous section, we have now introduced languages that require syntactically specified IMPERFECTIVE aspect. In these languages, we have hypothesized that syntactic PAST plays no role in CFs: this conclusion is straightforward in a language like Hindi, but requires more investigation into the temporal system of a language like Persian. Based on these patterns, we can conclude that in all of the languages encountered so far, a *single* temporal marker is required to mark CFs:

(27) New temporal CF typology

1. **Past CF languages:** require past tense – and nothing else – as a CF marker.

3 subtypes:

- (a) Languages that *appear* to also require imperfective
(Iatridou, 2000; Arregui, 2009; Ippolito, 2004)
- (b) Languages that *appear* to also require perfective
(Halpert and Karawani, 2012; Karawani and Zeijlstra, 2010)
- (c) Languages that allow *either* perfective or imperfective.
(Iatridou, 2009)

2. **Imperfective CF languages:** require imperfective as a CF marker – and nothing else.

2 subtypes:

- (a) Languages that *appear* to also require past tense.
- (b) Languages that *do not appear* to require past tense.

In the next section, we will examine the consequences of this expanded typology on for theoretical approaches to CFs.

5 CF typology and the theoretical landscape

We have shown in this chapter that languages that use temporal morphology to mark CFs *either* require [PAST] *or* [IMPERFECTIVE] – but not both. This conclusion diverges from previous assumptions that some languages do in fact require both past tense and imperfective aspect to form CF meanings. We have argued that this *illusion* or both tense and aspect marking in CFs arises from independent properties of a language’s morphology system. In particular, such situations come out of underspecification in a language’s temporal morphology.

In addition to this conclusion, the typology we present here illustrates two further important points about CF marking across languages. First, we have now seen languages like Zulu, Palestinian Arabic, and Hindi, where – unlike in Greek and the Romance languages – CFs can mark “real” tense and aspect even in the presence of “fake” morphology. Second, we have also seen that there is no *single* tense or aspect that is required across *all* languages that mark CFs with fake temporal morphology. Taken together, these generalizations have important implications for the theory of CF marking. In this section, we will see how these new facts can help us distinguish between different analyses of CF marking.

5.1 Analyses incompatible with revised typology

The typology that we have developed here is incompatible with certain approaches to temporal CF marking. One family of analyses that this typology rules out is one in which counterfactuality is derived directly from a past tense meaning (Ippolito, 2004; Arregui, 2009; Ferreira, 2011). These analyses seek to tie specific properties of temporal past tense meaning to the creation of a CF meaning. As we have now seen, languages such as Hindi and Persian, which mark CFs with [IMPERFECTIVE] alone, demonstrate that past tense semantics cannot be crucial to the generation of CF interpretations.

The typology developed here is also incompatible with the view that imperfective aspect makes a crucial semantic contribution – in addition to the contribution of past – in CF semantics, a proposal articulated in greatest detail by Ferreira (2011). The fact that languages like Palestinian Arabic and Russian allow perfective aspect – illusory or interpreted – in CFs further eliminates the weaker position that imperfective surfaces in CFs because CF interpretations are incompatible with perfective, as proposed by Arregui (2004).

Finally, the typology developed in this paper clearly demonstrates that CF clauses do allow “real” tense and aspect marking. Authors such as Ferreira (2011) and Arregui (2009) have proposed that ordinary temporal semantics are entirely overridden in CF contexts. Languages like Zulu, Arabic, Russian, and Hindi are all counterexamples to this: all allow real temporal marking, sometimes “doubled” with fake CF morphology. This typology

is more compatible with the work of ?, who argues that the interpretation of some CFs demonstrates the *semantic* presence of at least two “layers” of past: one linked to counterfactuality, the other to a temporal past interpretation.

5.2 Analyses favored by revised typology

The typology of CF marking developed in this paper also has positive contributions to the theoretical analysis of CFs.

First, the fact that in all languages investigated, only one temporal category (tense or aspect, but not both) is used to mark CFs suggests that there is a single syntactic position associated with the composition of CF semantics.

This is in line with the possibility that there is a CF operator in the relevant clauses, which can be spelled out either by a dedicated CF morpheme, or else by a morpheme that in other contexts spells out PAST or IMPERFECTIVE. Once this single choice has been made for a particular languages, other properties of CF morphology – e.g. the illusion of secondary marking, compatibility between CF marking and “real” inflection – should fall out from broader properties of the language’s inflectional morphosyntax.

Second, from the fact that Zulu, Arabic, and Hindi allow CF inflection to co-occur with “real” tense/aspect, we can conclude that CF inflection is associated with a position **distinct** from T^0 or Asp^0 . There is also reason to think that this position is **higher** than both T^0 and Asp^0 : in Arabic and Hindi, fake CF marking occurs on the highest verb or auxiliary, while real temporal marking is lower.⁸

Independently of such doubling, there is evidence from other languages that CF morphology is associated with a high – potentially left-peripheral – position. In Turkish, for example, the past morpheme appears to be structurally higher in when CF-linked than when temporally interpreted in indicative conditionals (?). Thus, while this morpheme occurs to the *left* of the conditional morpheme **-sa** when it has a temporal interpretation (28), it occurs to the *right* of the same morpheme in CF contexts (29). Assuming some version of the Mirror Principle (?), this morphological contrast suggests that CF-linked “past” is structurally higher than temporal past.

(28) Indicative: **V-past-cond**

Dün gece Can erken yat-**di-ysa** sabah erken kalk-abil-ir.
 Last night John early sleep-Past-COND morning early get-up-MOD-Past
 ‘If John went to bed early last night, he can get up early this morning.’

⁸In English, similarly, if we view the perfect as realizing temporal past in CF contexts, the CF past occurs “higher” than the temporal perfect.

(29) Counterfactual: **V-cond-past**

Dün gece Can erken yat-**sa-ydı** sabah erken kalk-ar-dı.
Last night John early sleep-COND-Past morning early get-up-AOR-Past
'If John had gone to bed early last night, he would have got up early in the morning.'

In a similar vein, ? show that conditional inversion – the marking of conditional antecedents by inversion of the finite verb to C^0 , as in *had I known...* – shows a cross-linguistic link to CFs. Indeed, they demonstrate that outside the verb-second Germanic languages, conditional inversion is possible only in CF antecedents. This pattern again suggests that CFs have some link to a left-peripheral position, potentially the same position that is the source of “fake” tense/aspect.

Finally, the typology developed in this paper is compatible with the idea that a CF operator – whatever its structural position – shares featural content with temporally-interpreted PAST. Many authors have suggested that CFs share some abstract meaning with past tense, at least metaphorically (Fleischman, 1989; James, 1982; Steele, 1975, a.o.). Some have suggested more concretely that CF and past tense share a **feature** in common (Iatridou, 2000; ?; Ritter and Wiltschko, 2010) – such a feature could form the basis of post-syntactic insertion of a single morpheme in both contexts.

More concretely, ?Ritter and Wiltschko (2010) propose that what we think of as “tense” is really a general function of clausal anchoring ([\pm coincidence]). They propose that this feature heads clauses in all languages, but may index different deictic properties in different languages. In familiar European languages, this feature indexes the time of situations, resulting in tense systems, but in (Halkomelem) Salish it indexes the location of situations, resulting in obligatory marking of proximal/distal relations, and in Blackfoot it indexes the participants in situations, resulting in obligatory marking of so-called local/non-local contrasts. Ritter and Wiltschko propose to extend this to CF marking, proposing that [-coincidence] in C^0 establishes non-coincidence of the world of the clause, rather than its time (or location, or participants).

This raises the question of whether imperfective, like past, can be understood as the realization of a [-coincidence] feature, accounting for the fact that Hindi and Persian appear to use IMPERFECTIVE – and not PAST – to mark CFs.

6 Conclusion

The general goal of this paper has been to broaden the descriptive typology of tense and aspect marking in CF clauses. We have demonstrated that languages can mark CFs with *either* PAST or IMPERFECTIVE – but not both. Addressing cases where individual languages

have been claimed to require both past and imperfective marking in CFs, we have made use of the idea that individual morphological forms can be underspecified for either tense or aspect. In non-CF contexts such morphemes receive a canonical interpretation for their underspecified value, but this does not mean that they reflect the syntactic presence of particular features.

This approach raises a number of questions for future research. First, though much work has been done suggesting a metaphorical or featural link between CF and past semantics, it remains to discover an analogous link between CF and imperfective. Even once such a link has been found, however, for languages that have both PAST marking and IMPERFECTIVE marking, it remains to ask what determines which of these morpheme appears in CFs.

We have also seen that languages differ in whether they can express both fake CF and real temporal marking in a single clause, but we have not seen any explanation of what causes languages to differ along this dimension.

Even with these questions outstanding, however, the broadened typology developed in this paper represents progress in the project of accounting for the inflectional morphological properties of CF clauses. Though a broader range of possibilities exist than was previously thought, we have demonstrated that this can in fact simplify the description of those possibilities, offering the potential for an ultimately more satisfying account of CF morphosyntax.

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