

DISPLACED ASPECT IN COUNTERFACTUALS: TOWARDS A MORE UNIFIED THEORY OF IMPERFECTIVITY*

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Abstract

Iatridou (2000, 2010) has established a cross-linguistic generalization that imperfective marking – more precisely, habitual marking – is one of the key grammatical ingredients of counterfactual conditionals (CFs). This is surprising, and Iatridou’s point is that imperfective marking in CFs seems to be fake, i.e., it does not convey what it does outside CF contexts. This paper proposes that imperfective morphology on CFs is real, but displaced. It shows up on the verbs in the antecedent and/or consequent of a CF conditional, but it scopes above a modal operator present in these constructions. This modal operator is a stativizer, so Imp is attached to a stative predicate. Ferreira (2005), inspired by Krifka et al. (1995), and specially Kratzer (2007), has tied habituality to plurality, and this paper relates statives to mass predicates. It is suggested that Chierchia’s (1998) observation on the selective properties of nominal quantifiers (there is no quantifier that selects for singular and mass predicates, excluding pluralities) applies also to the verbal/aspectual domain and helps us understand why Imp on CFs patterns with habituales and not with progressives.

Iatridou (2000, 2010) has established a cross-linguistic generalization that imperfective marking – more precisely, habitual marking – is one of the key grammatical ingredients of counterfactual conditionals (CFs). This is surprising, and Iatridou’s point is that imperfective marking in CFs seems to be fake, i.e., it does not convey what it does outside CF contexts, as shown below (from Iatridou 2010):

- (1) An pandrevotan mia prigipisa, tha esoze tin eteria
if marry-pst/-imp a princess, FUT save-pst-imp his firm
‘if he married a princess, he would save his company’

*This paper extends ideas about imperfectivity and plurality developed in my 2005 dissertation. I would like to thank all the people who helped me during the writing of the dissertation, specially my advisor, Irene Heim, to whom I am enormously grateful. Thanks also to an anonymous reviewer for helpful criticism. All remaining errors are mine.

The crucial point here is that these examples “are not understood as progressive or habitual, but rather as culminated events that would have been marked with perfective morphology outside CFs.” (Iatridou 2010)

Equally surprising is the fact that in languages in which progressives and habituais are marked differently, CFs pattern with the latter, not the former, as shown by the Hindi examples below (from Bhatt and Pancheva 2005):

- (2) *-taa* habitual marker as counterfactual marker: ok

agar Mona yahā: aa-tii, to me us-ke-saath fot.o khichvaa-taa
 if Mona.f here come-Hab then I her-with photo draw.caus-Hab
 ‘If Mona had come here, I would have had a picture taken with her.’

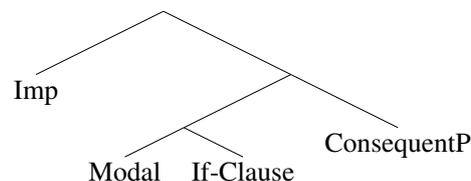
- (3) *rahaa* progressive marker as counterfactual marker: not ok

agar Mona yahā: aa rahii hai to Sona-bhii aa-egii
 if Mona.f here come Prog.f be.Prs then Sona.f-also come-Fut.f
 ‘If Mona is coming here, then Sona also will.’ [Note: not counterfactual.]

In Iatridou’s words: “I have not been able to find a language where CFs and progressives are formally alike with generics/habituais marked differently”.

The modest goal of this paper is to offer some preliminary, very speculative remarks that may help us understand/derive this generalization. I argue that despite appearances, imperfective marking on CFs is real, but displaced. It shows up on the verbs in the antecedent and/or consequent of a CF conditional, but it scopes above a (possibly silent) modal operator present in these constructions. This modal predicate is stative, so an imperfective operator (Imp) is in fact attached to a stative predicate. Both the antecedent and the consequent of CFs are thus unmarked for (im)perfectivity.

- (4)



Trying to explain why CF Imp patterns with habituais and not progressives, I extend Ferreira’s (2005) unifying account of imperfectivity, according to which progressive readings involve quantification over singular events, whereas habitual readings involve quantification over plural events (sequences of events). Ferreira proposes that Imperfective markers which can convey both progressive and habitual readings (Greek, Romance) are like nominal quantifiers, such as “some”, which is not selective with respect to the number of its argument (some man/some men), and those which convey only habitual readings are like Italian “alcuni” ‘some-pl’, which selects for plural predicates only (alcuni uomini “some men”/*alcuno uomo “some man”; Chierchia (1998)).

I take stative predicates to be the verbal counterpart of mass nominal predicates, and establish a parallel to the following generalization made by Chierchia (1998) with respect to nominal quantifiers:

- (5) There are quantifiers for mass and plural nouns that exclude singulars (like English *most* or Italian *molto*, but there are no quantifiers for mass and singular nouns that exclude plurals.

In the aspectual/imperfectivity domain, this means that there should be no Imp operator that accepts statives and singular event predicates, excluding plural ones. Given Ferreira's theory, this means that imperfective statives should pattern with habituales and not with progressives. Since I am assuming that CFs are constructions in which Imp is attached to a modal/stative predicate, CF Imps should never pattern with progressives, explaining Iatridou's generalization.

The paper is organized as follows: in section 1, I present the empirical basis for Iatridou's Generalization that past tense and imperfective morphology are cross-linguistically related to counterfactual constructions. In section 2, Ferreira's unifying account of progressive and habitual readings of imperfective sentences are introduced, with the focus on eventive predicates. In section 3, stative predicates are incorporated into the analysis and in section 4 issues concerning modality are briefly discussed, paving the way to an explanation of Iatridou's generalization. This is done in section 5, in which I detail my proposal of a displaced imperfective morpheme in CFs. Section 6 is a brief conclusion with some indications of how the analysis can be extended to account for other imperfective constructions.

1 Iatridou's Generalization

Iatridou's survey of the grammatical ingredients of counterfactuality begins with what she calls *fake past*. What she means is that in many languages we find past tense morphemes in CFs which do not seem to convey pastness and would not be used in non-CF constructions. Here are some contrasting examples presented by her:

- (6) a. If I had a car (now), I would be happy.
b. *I had a car now.
- (7) a. If he had been descended from Napoleon he would have been shorter.
b. *He had been descended from Napoleon.
- (8) a. If he left tomorrow, he would get there next week.
b. *He left tomorrow.

As the examples make clear, in CFs the past tense can be used to convey hypothetical situations in the present and in the future. Moreover, when the hypothesis is about the past, we find the past tense on top of a perfect construction (have+participle), which by itself can locate a situation in the past ("John has eaten an apple").

We will return briefly to fake tense marking in CFs in section 4. We now turn to Iatridou's second major point which concerns fake aspectual marking or, more precisely, fake imperfective marking, in CFs. The perfective/imperfective opposition in which we are interested here has to do with whether an event is presented as completed (perfective) or as on-going (imperfective) (see Comrie (1976)).

- (9) John wrote a letter yesterday. (*perfective*)
(10) John was writing a letter (when I called him). (*imperfective*)

Among imperfective readings, two flavors can be distinguished: progressive and habitual readings. Details aside, progressive readings convey that a certain event is going on and habitual readings convey that a certain type of event occurs regularly:

- (11) John was writing a poem. (*progressive*)
 (12) John used to write poems. (*habitual*)

Importantly, many languages use the same morphological marking to express progressive and habitual readings. Here is a Modern Greek example from Iatridou:

- (13) eperne to farmako
 take-past-imp the medicine
 ‘He was taking the medicine/He used to take the medicine.’

Turning now to CFs, as Iatridou observes, “in general, the Greek verb is either in the perfective or the imperfective. However, in CFs, the verb always appears in the imperfective”. She gives the following examples to illustrate this fact:

- (14) An eperne to farmako, tha ginotan kalitera
 if take-pst-imp the medicine, FUT become-pst-imp better
 ‘If s/he took the medicine, s/he would get better’
 (15) An pandrevotan mia prigipisa, tha esoze tin eteria
 if marry-pst/-imp a princess, FUT save-pst-imp his firm
 ‘if he married a princess, he would save his company’

Her crucial point here is that “these examples are not understood as progressive or habitual. The events are understood as culminated and would have been marked with perfective morphology outside CFs”. Thus we seem to have an instance of fake imperfective in Greek CFs. As Iatridou shows, other languages with perfective/imperfective morphology seem to follow the same pattern.

At this point one might ask what happens with CFs in languages which have specialized markers for imperfectivity, one for progressive readings and one for habitual readings. Hindi is such a language, as the following examples from Bhatt and Pancheva (2005) show:

- (16) Yusuf skuul jaa-taa hai
 Yusuf.m school go-Impfv/Hab.MSg be.Prs.Sg
 ‘Yusuf goes to school.’
 (17) Yusuf skuul jaa rahaa hai
 Yusuf.m school go Prog.MSg be.Prs.Sg
 ‘Yusuf is going to school.’

Bhatt and Pancheva (2005) points out that “the syncretism that we find in Hindi is between the marker of Habitual meaning and the marker of Counterfactual meaning, and not between the marker of Progressive meaning and the marker of Counterfactual meaning.” The following example illustrates the point:

- (18) *-taa* habitual marker as counterfactual marker: ok
 agar Mona yahā: aa-tii, to me us-ke-saath fot.o khichvaa-taa
 if Mona.f here come-Hab then I her-with photo draw.caus-Hab
 ‘If Mona had come here, I would have had a picture taken with her.’
- (19) *rahaa* progressive marker as counterfactual marker: not ok
 agar Mona yahā: aa rahii hai, to Sona-bhii aa-egii
 if Mona.f here come Prog.f, be.Prs then Sona.f-also come-Fut.f
 ‘If Mona is coming here, then Sona also will.’
 [Note: not counterfactual.]

Thus, CF imperfectives in Hindi are habituals, not progressives. Moreover, as discussed by Iatridou (2000, 2010) and Bhatt and Pancheva (2005), habitual marking on Hindi CFs seems to be fake. First, although the progressive marker and the habituality marker cannot cooccur outside of CF contexts, in CFs they can:

- (20) * vo gaa rahaa ho-taa
 he sing Prog be-Hab
- (21) 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.MPI be-Hab.MPI
 ‘If he was singing, people would be going *wah wah*’.

Second, although individual-level statives usually cannot take the habituality marker, in CFs they can:

- (22) * vo lambaa ho-taa (hai)
 he tall be-Hab (is)
- (23) agar vo lambaa ho-taa, to army use bharii kar le-tii
 if he tall be-Hab then army he.Dat admit do take-Hab.f
 ‘If he was tall, the army would have admitted him.’

Finally, although habitual sentences take one habituality marker, CFs whose hypothesis is about a habitual statement, take two habituality markers:

- (24) Vo macchlii khaa-taa hai
 He fish eat-Hab be.Prs
- (25) 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 (on a regular basis), then he would not have this disease.’

As the data above clearly shows, the imperfective marking that we find in Hindi CFs is indeed a fake, habitual marking.

Commenting on her extensive cross-linguistic survey on tense and aspect marking on CFs, Iatridou reports the following: “I had not been able to find a language where CFs and progressives are formally alike with generics/habituals marked differently.”

Based on this important finding, she states what I am calling Iatridou’s Generalization:

(26) *Iatridou's Generalization*

In languages without a dedicated CF morpheme, verbs in CF constructions are marked as imperfective. When such a language has different forms for progressive and habitual readings, CFs pattern with habituals, not with the progressive.

In the rest of this paper, I try to develop an explanation to this generalization.

2 Imperfectivity and Number

My analysis is couched within an event-based framework (Davidson (1967), Parsons (1990)) in which verb phrases denote (characteristic functions of) sets of events.

(27) $\llbracket \text{John kiss Mary} \rrbracket = \lambda e. e$ is an event of John kissing Mary

(Im)perfectivity is contributed by an Aspectual head that turns sets of events into sets of time intervals, binding the event variable and introducing a *reference* or *topic* interval (Klein (1994), Kratzer (1998)) related to the time of the event described by the verb phrase.¹

As far as the temporal ingredients of a sentence is concerned, the only difference between perfective and imperfective heads is that the former requires the event time to be included in the reference time, whereas the latter requires the reference time to be included in the event time.²

(28) $\llbracket \text{Perfective} \rrbracket = \lambda P. \lambda i. \exists e : \tau(e) \subset i \ \& \ P(e)$

(29) $\llbracket \text{Imperfective} \rrbracket = \lambda P. \lambda i. \exists e : i \subseteq \tau(e) \ \& \ P(e)$

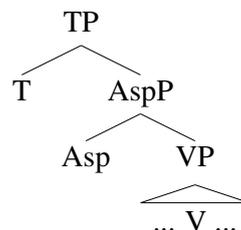
Finally, the reference interval is related to the speech time by a Tense head, which denotes a contextually salient time interval (Partee (1973), Heim (1994)).

(30) Present and Past tenses (g is an assignment function)

- a. $\llbracket \text{pres}_i \rrbracket^g = \begin{cases} g(i) & \text{if } g(i) = \text{speech time} \\ \text{undefined} & \text{otherwise} \end{cases}$
- b. $\llbracket \text{past}_i \rrbracket^g = \begin{cases} g(i) & \text{if } g(i) < \text{speech time} \\ \text{undefined} & \text{otherwise} \end{cases}$

Assuming the simplified clausal skeleton in (31), and putting modality issues aside for the moment, we get the interpretations in (32) and (33):

(31)



¹In this paper, we will be mainly concerned with examples with a single layer of aspectuality. To interpret clauses with more than one such layer, we need to assume that aspectual heads turn sets of events/states into sets of events/states. A type shifting operation will then apply at the Tense level, turning sets of events/states into sets of intervals corresponding to the duration of the events/states.

²Modality is being disregarded for the moment. For modal analyses of the progressive, see Dowty (1977), Landman (1992), Portner (1998), among others. For habituals, see Krifka et al. (1995), and references therein.

- (32) John kissed Mary.
 [TP Past₁ [AspP Pfv [VP John kiss Mary]]]
 “An event of John kissing Mary is included in a salient past interval”.
- (33) John was kissing Mary.
 [TP Past₁ [AspP Imp [VP John kiss Mary]]]
 “An event of John kissing Mary was going on at a salient past interval”.

As for the two flavors of imperfectivity – progressive and habitual readings – Ferreira (2005) assumes that the contrast is minimal and has to do with plurality: progressive readings involve quantification over singular events whereas habitual readings involve quantification over plural events. At this point, I restrict my attention to events and eventive predicates. States and stative predicates will be discussed in the next section.

The idea to take plurality of events as a semantic ingredient of habituality appears in Krifka et al. (1995, pp. 39-40) in connection to a discussion about indefinites in habitual sentences. The oddness of sentences such as (34) below is attributed to the fact that it involves quantification over “sum situations”.

- (34) Mary smokes a cigarette.

The presence of a singular indefinite would convey the unusual scenario of Mary smoking the same cigarette over and over again. Kratzer (2007) is more explicit in her discussion of the same type of example and proposes a compositional implementation according to which such habitual verbal forms relate individuals and plural events. Since singular indefinites existentially quantify over atomic individuals, the resulting VP – *smoke a cigarette* – will denote a set of plural events whose minimal elements are events in which the same cigarette is smoked. Things are different when bare plurals replace the singular indefinite, as in *Mary smokes cigarettes*. In such cases, Kratzer says that plural events will relate cumulatively to plural individuals, allowing scenarios in which Mary smoke different cigarettes at different occasions.

Inspired by these ideas, my implementation (see also Ferreira 2005) assumes that the domain of events contain atomic/singular elements as well as non-atomic/plural ones. Plural events are mereological sums having singular events as their minimal parts. VP predicates – like count NP predicates – can be either singular or plural. For concreteness, I follow Kratzer (2007) in assuming that lexical predicates are cumulative (closed under sum formation) and that VP denotations can contain both singular and plural events. The role of number morphology – sg and pl – is intersective, removing atoms or non-atoms from a predicate denotation. Thus, in a scenario in which only three events – e_1, e_2, e_3 – of John kissing Mary have happened, we would have the following denotations for the VP *John kiss Mary*:

$$(35) \llbracket \text{VP} \rrbracket = \{e_1, e_2, e_3, e_1 \oplus e_2, e_2 \oplus e_3, e_1 \oplus e_3, e_1 \oplus e_2 \oplus e_3\}$$

$$(36) \llbracket \text{VP}_{sg} \rrbracket = \{e_1, e_2, e_3\}$$

$$(37) \llbracket \text{VP}_{pl} \rrbracket = \{e_1 \oplus e_2, e_2 \oplus e_3, e_1 \oplus e_3, e_1 \oplus e_2 \oplus e_3\}$$

Time intervals can also be singular or plural, and the following is assumed (τ being a function mapping events to the interval corresponding to their duration):

$$(38) \quad \tau(e \oplus e') = \tau(e) \oplus \tau(e')$$

Once we assume the existence of plural intervals, we need to redefine relations between time intervals in order to take pluralities into account. Crucial for our purposes here is the inclusion relation, which we define as follows:

(39) *Inclusion*

An interval i is included (\subseteq) in an interval i' iff the left boundary of i' precedes the left boundary of i and the right boundary of i precedes the right boundary of i' .

The left/right boundary of an interval can be viewed as the time point that precedes/follows every other point belonging to the interval. Thus, we have the following results:³

$$(40) \quad \text{---}[i_1\text{---}][i_2\text{---}]\text{---} \longrightarrow i_2 \subseteq i_1$$

$$(41) \quad \text{---}[i_1\text{---}][i_3\text{---}][i_2\text{---}]\text{---} \longrightarrow i_3 \subseteq i_1 \oplus i_2$$

Turning back to imperfectivity, the idea is that both progressive and habitual readings are derived from a single aspectual operator, namely, *Imp*. When *Imp* combines with a singular VP predicate, we get the progressive reading. When it combines with a plural VP predicate, we get the habitual reading. As an illustration, consider the following Italian sentence, which is ambiguous between a progressive and a habitual reading:

- (42) Gianni fuma
Gianni smokes
'Gianni smokes or Gianni is smoking'

$$(43) \quad [\text{TP Pres}_1 [\text{AspP Imp} [\text{VP Gianni fuma}]]]$$

The idea is that if VP is singular, an (atomic) event of Gianni smoking must be going on at the utterance time for the sentence to be true. This is the progressive reading. If VP is plural, a sequence of events of Gianni smoking must be going on at the utterance time. In this case, Gianni does not have to be smoking at the utterance time. This is the habitual reading.^{4 5} As we already mentioned, many languages have imperfective verbal forms which are ambiguous in this way. This reductionist proposal aims at accounting for this fact.

However, in many other verbal forms, only progressive or only habitual readings are available. Ferreira suggests that in these cases we have number sensitive *Imp* operators, selecting for singular or plural VPs. This is the case of the Portuguese and the English simple present, which only give rise to the habitual reading:

³Notice that an interval i can be included in a plural interval j , even if i and j do not have any time points in common.

⁴More precisely, this type of example is what Ferreira (2005) called a simple habitual. It differs from habitual sentences formed with the help of a (possibly silent) operator, as in *John (always, usually) smokes, when he drinks*. In these cases, which will briefly be discussed in section 6, we have universal/proportional, restricted quantification over events. With simple habituals, it is not clear at all what could play the role of the restrictor of the (implicit) quantifier. Indeed, a sentence like 'John smokes' can be uttered without the intention to link situations of John smoking to any other kind of situation, and a hearer does not feel compelled or invited to accommodate any kind of situation either.

⁵I am still ignoring modality here. I will discuss some modal issues connected with imperfectivity in section 4.

(44) João fuma/John smokes.

(45) [TP Pres₁ [AspP Imp [VP-Pl John smokes]]]

In this case, we have a specialized version of Imp selecting only for plural VPs, making the progressive reading unavailable.

Natural languages also instantiate specialized versions of Imp selecting only for singular VPs, making the habitual reading unavailable. This is the case of the progressive marker in Hindi presented in the previous section:

(46) Yusuf skuul jaa rahaa hai
 Yusuf.m school go Prog.MSg be.Prs.Sg
 ‘Yusuf is going to school.’

(47) [TP Pres₁ [AspP Imp [VP-Sg Yusuf go to school]]]

Ferreira suggests that this number sensitivity is similar to the one attested with nominal determiners. For instance, the English indefinite determiner *some* is not sensitive to number and can combine with both singular and plural NPs (*some boy/some boys*). This is parallel to what happens with Imp in the Italian simple present. On the other hand, the indefinite determiner *alcuni* in Italian only combines with plural NPs (**alcuno uomo/alcuni uomini*). This is parallel to the Imp in the English or Portuguese simple present. Finally, the English indefinite determiner *a/an* only combines with singular NPs (*a boy/*a boys*) and is parallel to the Hindi Imp *rahaa* seen above.

3 Statives and Number

We now need to incorporate stative predicates into the analysis. Consider the following two sentences:

- (48) a. John smokes.
 b. John lives in Paris.

They are both simple present sentences. The first has a habitual, but not a progressive reading. The second simply conveys that the state of John living in Paris holds at the speech time, with no suggestion of plurality or habituality. In the previous section, we have assumed that the English simple present is a combination of present tense with an imperfective operator that selects for plural predicates. We now need to revise this idea if we want to assign the same morpho-syntactic profile to both sentences above.

Another piece of evidence that on-going stativity and habituality seem to pattern together from a morphosyntactic point of view comes from the Past Imperfect in Colloquial Brazilian Portuguese. For many speakers, such verbal forms only have habitual readings with eventive predicates. The progressive reading is strongly dispreferred or simply rejected. Stative predicates, however, are fine, and, as in the case of the simple present forms, simply convey that the state holds in the reference time:

- (49) *Colloquial Brazilian Portuguese Past Imperfect*
 a. João fumava (only habitual)
 João smoked-imp

- b. João morava em Paris
 João lived-imp in Paris

Here, I would like to suggest a tentative generalization, relating habitual and stative imperfective forms:

(50) *A Tentative Generalization*

When a language has specialized imperfective forms, one for progressive and one for habitual readings, stative predicates go with the latter, not the former.

The idea I would like to explore is that stative predicates are like mass predicates. They are non-atomic, homogeneous predicates of states and from a semantic point of view, they are neither singular nor plural predicates. On the other hand, non-stative, eventive predicates, are count predicates and can be singular or plural.⁶ Given what we have proposed above on imperfective operators, we arrive at the following schema:

- (51) progressive reading \rightsquigarrow *Imp* + singular VPs
 habitual reading \rightsquigarrow *Imp* + plural VPs
 on-going stativity \rightsquigarrow *Imp* + mass-like VPs

Thus, the emerging cross-linguistic generalization regarding *Imp*'s selection properties is the following: we find *Imp* selecting for plural and mass predicates (excluding singular ones), but we do not find *Imp* selecting for singular and mass predicates (excluding plural ones).

If this is on the right track, it seems like the verbal counterpart of a parallel generalization made by Chierchia (1998) about the nominal domain:

- (52) There are quantifiers for mass and plural nouns that exclude singulars (like English *most* or Italian *molto*, but there are no quantifiers for mass and singular nouns that exclude plurals.
 [Chierchia (1998)]

Chierchia tries to explain his generalization by saying that quantifiers that select for mass and plural predicates are sensitive to the closure under sum formation of their denotations. The non-existence of quantifiers that select for singulars and mass predicates is due to the absence of a natural property that would apply only to these predicates excluding pluralities. I will tentatively assume that the same holds in the verbal domain.

At this point, it is instructive to repeat the generalization made by Iatridou and presented in the previous section concerning the relation between habitual and counterfactual imperfectives:

⁶Here, we depart from Bach (1986), who takes atelic predicates (statives and activities) to be the verbal counterpart of mass nouns, and telic predicates (accomplishments and achievements) to be the verbal counterpart of count nouns. We also depart from Rothstein (2004), who assumes that all verbal predicates – even statives – are count predicates. We acknowledge the fact that activities, like mass nouns, are homogeneous in the sense that if John ran from 8 to 10, he also ran from 8 to 9 and from 9 to 10. However, Rothstein (2004) discusses count nouns such as *fence*, *sequence*, *twig* which seem to be homogeneous (and cumulative). According to her, what is peculiar about these count nouns is that their atomicity – the criterion to decide what counts as an atom – is context dependent. In this regard they differ from other count nouns, such as *dog*, which are naturally atomic. Although I will leave many issues related to this topic open, the line I will pursue here is that stative predicates are like mass nouns, and eventive predicates are like count nouns. Activities are not naturally atomic, whereas accomplishments are. For a detailed discussion of these issues, see Rothstein (2004) and the references therein.

- (53) I had not been able to find a language where CFs and progressives are formally alike with generics/habituals marked differently.
[Iatridou (2010)]

The idea that I will explore in the rest of this paper is that CF Imps apply to a stative (mass) predicate. Therefore, they are expected to pattern with habitual (plural) and not with progressive (singular) imperfectives. This, I suggest, is the explanation behind the above observation. Before developing this idea in more detail, I will briefly discuss the modal ingredients of imperfectivity.

4 Imperfectivity and Modality

Portner (1998) proposes a kratzerian modal account for the progressive operator, according to which it quantifies over a set of accessible worlds obtained from a modal base and an ordering source. Putting many details aside, the modal base is circumstantial and selects worlds that share with the actual/evaluation world a number of characteristics, depending on what is going on at some reference time. The ordering source ranks worlds based on an ideal according to which the event type described by the sentence is not interrupted by anything. Take, for instance, the sentence *John is crossing the street* uttered at 3PM, a few seconds after John started walking from one side of the street to the other. The modal base will select worlds in which John is doing what he was actually doing at 3PM. The ordering source will favor worlds in which an event of John crossing the street is not interrupted (a car does not hit him, a bus does not hit him, he does not suffer a heart attack, he does not get shot, etc ...). Thus, among the worlds selected by the modal base, the ones that rank best according to the ordering source are the ones in which there are as few as possible interruptions. In our scenario, these are worlds in which John's walking from one side of the street to the other does not get interrupted by any external obstacle. The sentence is true if in all these worlds, there is a complete event of John crossing the street. Notice that the actual/evaluation world may not be among the worlds being quantified over (John may get hit by a bus, for instance), and a sentence such as *John was crossing the street* does not entail that *John has/will have crossed the street*.

I will adopt Portner's analysis here, which gives us the following entry for the imperfective operator (\wp is a property of events, and M, O are the modal base and the ordering source, respectively):

$$(54) \quad \llbracket \text{Imperfective} \rrbracket = \lambda \wp. \lambda i. \forall w' \in \text{Best}(M, O) \exists e : i \subseteq \tau(e) \ \& \ \wp(w')(e)$$

It is important to notice that when the VP predicate is atelic, as in *John is running*, modal effects seem to vanish, and the sentence entails that John has/will have run. This apparent lack of modality can be explained as a byproduct of the interaction between the circumstantial modal base, and the reasonable assumption that singular, atelic predicates induce an empty ordering source, due to their homogeneity. Once John has started running, there is no way of avoiding the occurrence of an event of John running, and at any given time t , if John is running at t , there will be an actual event of John running whose time includes t . Hence, it is expected that the modal flavor that is noted with accomplishments like *John crossing the street* will not be felt with activities like *John running*.

Ferreira (2005) extends Portner's proposal to habituals, assuming that the same modal ingredients are involved in both progressive and habitual readings of imperfective sentences. The

only difference concerns the number of the events that are going on. In the case of the progressive, we talk about singular events, whereas in the case of habituais, we talk about plural events. Thus, for a sentence such as *John smokes*, the circumstantial modal base selects worlds in which John's recent activities in the actual world as well as his actual physical and mental capacities are preserved. The ordering source will favor worlds in which sequences of events of John smoking are not interrupted (he does not die suddenly, nobody forces him not to smoke, etc). The sentence will be true if in the best worlds among those selected by the modal base, a sequence of events of John smoking takes place. Due to the combination of the circumstantial modal base and the non-interruption ideal of the ordering source, in the worlds being quantified over, John smoked in the past and will smoke again in the future. Whether or not John will smoke again in the actual world cannot be inferred solely on the basis of the meaning of *John smokes* since the actual world may not be among the best possible worlds in this case (he may suddenly die right after the sentence has been uttered, for instance). Notice that contrary to what we saw above with progressive readings with activity predicates, modal effects are expected in habitual readings of sentences with such predicates. At any given time t , the existence of actual, past events of John smoking does not entail the existence of future events of him smoking, and therefore does not entail the existence of a plural event of John smoking whose time includes t (given our definition of inclusion in the previous section).

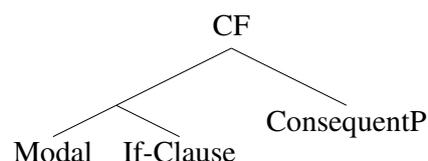
Finally, we assumed that imperfective sentences with stative predicates, such as *John lives in Paris*, combines an Imp operator with a numberless, mass-like predicate. As in the case of the progressive reading of activities, no modal flavor is noticed. *John lives in Paris* simply asserts that the state of John living in Paris holds at some reference time (the utterance time, in this case). Here too, we attribute this apparent lack of modality to the circumstantial modal base of Imp and the homogeneity of stative predicates, which induces an empty ordering source. If John lives in Paris at some time t , a state of John living in Paris holds in the actual world at a time that includes t .

The upshot of this discussion is the following: although I am assuming that imperfective operators always introduce modal ingredients in the meaning of imperfective sentences, modal effects are not detectable in the progressive reading of activities and, more important to what follows, they are not detectable with stative predicates at all.

5 Displaced Aspect

We now return to counterfactual conditionals. We start by assuming that conditionals in general – and CFs in particular – are formed by a (possibly silent) modal quantifier, and that *if* clauses play the role of a restrictor of this quantifier (Lewis (1975), Kratzer (1981) and many authors after them).

(55)



Following work by Robert Stalnaker and David Lewis, among others, we assume that modal quantification in CFs are based on a notion of similarity among worlds, and employ some sort of function that selects worlds in which the if-clause is true and which are as similar as possible to

the evaluation (e.g. actual) world. What gives CFs its name is that they convey that the if-clause is false in the evaluation world. Putting many details aside, we get the following:

(56) If John were sick, he would be at home.

Implication: John is not sick

Assertion: The worlds in which John is sick and which are most similar to the actual world are also worlds in which John is at home.

Recall from section 1 that past tense morphology is one of the grammatical ingredient in CFs, even when the hypothetical situations under consideration are located in the present (as in the example above) or in the future. This led Iatridou (2000) to label CF past tenses as *fake*, since they do not convey what they do (i.e. pastness) outside CF contexts. Ippolito (2003) and Arregui (2005), however, argued that the past tense in CFs is real, but displaced. Although it shows up in the antecedent and the consequent of CFs, it is semantically related to the modal operator. Ippolito (2003), for instance, proposes that the past tense in CFs has a semantic effect on the selection of the possible worlds the modal operator quantifies over. Arregui (2005) analyses CFs as *de re* claims about the past. She proposes that both the antecedent and the consequent of CFs are (semantically) tenseless and denote properties of time intervals, as schematically shown below

(57) If John were sick, he would be at home.

MODAL(PAST)(λi . John be sick at i)(λi . John be at home at i)

The following paraphrases, though not precise, may help clarify the idea:

(58) If John were sick, he would be at home.

[In the most similar worlds in which the past led to a present in which John is sick, John is also at home]

(59) If I had won the lottery, I would have bought a car.

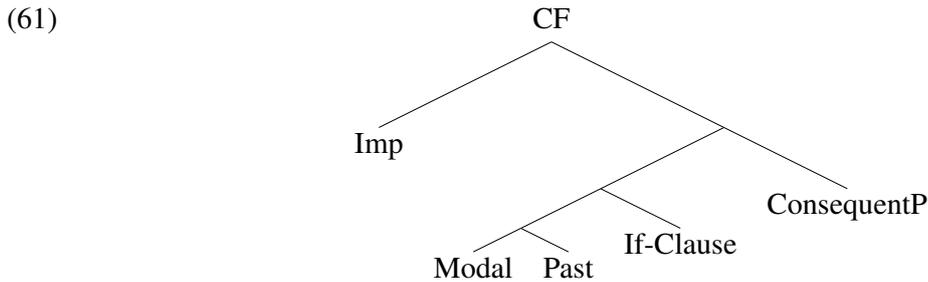
[In the most similar worlds in which the past led to present in which I have won the lottery, I have also bought a car]

(60) If John took the medicine, he would get better.

[In the most similar worlds in which the past led to a present in which John takes/will take the medicine, John also gets/will get better]

Notice that both the if-clause and the consequent clause are evaluated at the utterance time. Pastness plays a role only in the characterization of the possible worlds being quantified over.

What about the imperfective, habitual aspect marking that Iatridou diagnosed as another grammatical ingredient of CFs, and was also shown to be fake, i.e., not to convey the idea of an on-going habit? My suggestion goes along the same lines as Ippolito's and Arregui's ideas about the past tense. The imperfective morpheme "scopes" above the modal operator. The if-clause and the consequent clauses are not specified for (im)perfectivity, and in the framework I am adopting here they denote properties of events.



My crucial assumption is that the modal combines with the past tense, the if-clause and the ConsequentP and outputs a stative predicate. It is this stative predicate that will serve as an argument to the imperfective operator located immediately above it. Given what we have seen in the previous sections, stative (mass) predicates are selected by the same Imp morpheme that selects for plural predicates and that triggers habitual readings. Hence, the fact that CF Imp and habitual Imp are formally alike. This is our tentative explanation for Iatridou's generalization. The fact that no "habitual flavor" can be noticed follows from the way stative predicates and the Imp operator interact, as discussed in the previous section.

Treating CF modals as statives seems natural if we notice that other modal predicates behave like stative predicates. For instance, English and Portuguese modal verbs can appear in the simple present without conveying plurality of events, just like any non-modal stative predicate, and different from eventive predicates. The examples below simply convey a current possibility or permission:

(62) Pedro pode estar em casa.
 Pedro may be at home
 'Pedro may be at home.'

(63) Pedro pode deixar o país.
 Pedro may leave the country
 'Pedro may leave the country.'

Moreover, in Hindi, we can see the specialized habitual imp occurring with modals, conveying for instance a person's ability at a certain reference time:

(64) Yusuf havaii-jahaaz uraa sak-taa hai/thaa
 Yusuf air-ship fly CAN-hab be.Prs/be.Pst
 Yusuf is/was able to fly airplanes' [Bhatt (1999, p.176)]

As for the denotation of the CF modal, we need something along the following lines:

(65) $\llbracket \text{CF-modal} \rrbracket^{t^*, w^*}(i)(P)(Q) = \lambda s. s$ is a state such that the worlds most similar to w^* in which i led to a present (t^*) at which some P-event/state happens/holds are also worlds in which i led to a present (t^*) at which some Q-event/state happens/holds.

And after *Imp* and *Past* in (61) are interpreted, we have:

- (66) $\llbracket \text{CF} \rrbracket^{t^*, w^*} = \exists s : t^* \subseteq \tau(s) \ \&$
 the worlds most similar to w^* in which the past led to a present (t^*) at which some P-event/state happens/holds are also worlds in which the past led to a present (t^*) at which some Q-event/state happens/holds.

The idea is that the modal state holds in a world w^* if the worlds whose pasts are as similar as possible to w^* 's past and in which there is a P-event/state that happens/holds at the utterance time (t^*) are also worlds in which a Q-event/state happens/holds at the utterance time (t^*).

If the proposal sketched above is on the right track, the aspectual head above the modal operator will not be under the scope of any past tense head and would be semantically related to the utterance time. My speculative remark here is that this might be the explanation behind Iatridou's point that imperfectivity is one of the grammatical ingredients of counterfactuals. The reasoning would go as follows: there seems to be a cross-linguistic constraint on present perfectives. Comrie (1976) mentions that present perfectives are much less common than past perfectives, and when we do find such combinations, they are interpreted as a future tense or get some special meaning, as in the so-called narrative present. As the author points out, the present tense is "essentially imperfective." This incompatibility between present tense and imperfective aspect can be seen as a consequence of the (proper) inclusion relation introduced by the perfective head and the assumption that the present tense denotes the utterance time, which is conceptualized as an indivisible, minimal time interval. Therefore, present+perfective would be incoherent from a semantic point of view.

6 Final Remarks

We have proposed that imperfective morphology on CFs is real, but displaced. It shows up on the verbs in the antecedent and/or consequent of a CF conditional, but it scopes above a modal operator present in these constructions. This modal operator is a stativizer, so Imp is attached to a stative predicate. Ferreira (2005), inspired by Krifka et al. (1995), and specially Kratzer (2007), has tied habituality to plurality, and we have just tied stativity to mass predicates. I suggested that Chierchia's observation on the selective properties of nominal quantifiers (there is no quantifier that selects for singular and mass predicates, excluding pluralities) applies also to the verbal/aspectual domain and helps us explain why Imp on CFs patterns with habituals and not with progressives: mass and plural predicates are algebraically closer to each other than mass and singular predicates are.

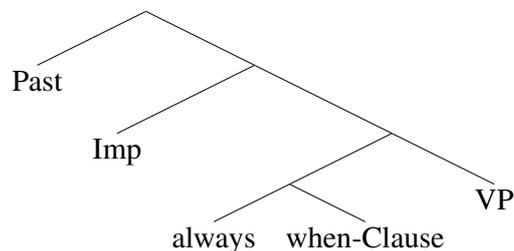
Several issues remain open. For instance, I have been quite speculative on why perfective verbal forms seem not to be used in CFs. I have tied this fact to a cross-linguistic ban on present+perfective combination. An alternative line of inquiry might be the actuality entailments triggered by the use of perfective aspect with certain modal verbs, as discussed by Valentine Hacquard (see Hacquard 2006). Such an entailment would, of course, be inconsistent with counterfactuality and this may help explain why perfective conditionals would not be CF conditionals. On the other hand, we have focused our analysis on the empirical findings in Iatridou's work, specially data from Romance, Greek, and Hindi. Bjorkman and Halpert (2013) and Halpert and Karawani (2012) have discussed data from languages that seem to behave differently, indicating that the ban on perfective CFs might not be universal, but rather depend on how pastness and (im)perfectivity are encoded on verbal affixes. If this is on the right track, it will definitely have an impact on the ideas put forward in this paper. It is clear that much work remains to be done.

Nevertheless, I would like to finish by pointing out some possible extensions of the analysis put forward in this paper, hoping that the idea of a displaced imperfective head may also shed light on other constructions in which the imperfective morpheme seems not to be interpreted in the position in which it is pronounced. Consider, for instance, some sentences with Q-adverbs in Romance (the example below is from Portuguese):

- (67) João sempre escrevia um relatório, quando demonstrava um teorema.
 João always write-PastImp a report, when demonstrate-PastImp a theorem
 ‘John always wrote a report, when he demonstrated a theorem.’

In (67), we notice that both the verb in the main clause and the verb in the when-clause are in the past imperfect and both predicates are telic. If in isolation, these clauses would express the occurrence of events/habits in progress. However, what the sentence conveys is a past generalization relating complete, culminated events of John demonstrating a theorem and complete, culminated events of John writing a report. This is very much the same situation that Iatridou found with CFs in Greek and other languages, and part of what I proposed in the previous section can be extended to these cases as well:

(68)



Here, both *Past* and *Imp* scope above the Q-adverb. The when-clause and the main clause VP are not specified for (im)perfectivity and express properties of events. The Q-adverb introduces restricted, universal quantification over events, and outputs a predicate of states:

- (69) $[[\text{always}]](P)(Q) = \lambda s. \forall e : [e \subseteq \tau(s) \ \& \ P(e)] \rightarrow [\exists e' : Q(e') \ \& \ R(e, e')]$

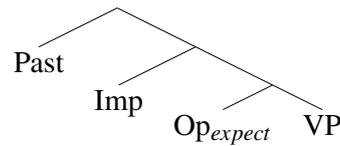
The states characterized in (69) hold in an interval *i* if for every P-event happening within *i*, there is a contextually related Q-event. For our purposes, we may view this relation as temporal proximity (but see Rothstein (1995) for discussion of this issue). The imperfective operator will then combine with this stative predicate, yielding a property of intervals *i* such that an state of the type described in (69) is going on at *i*.

Another possible extension of the idea of displaced aspect comes from certain modal uses of Past imperfect in Italian, such as (70) below from Giorgi and Pianesi (2004):

- (70) Pavarotti cantava domani.
 Pavarotti sang-imp tomorrow
 ‘Pavarotti was expected to sing tomorrow.’

Giorgi and Pianesi proposes an analysis according to which there is a silent modal operator in (70) meaning *it is expected to*. If we assume that this operator takes a predicate of events (P) as its argument and returns a set of states as output (the state of expecting that a P-event occurs), we can assume that *Imp* (and *Past*) scopes above this operator, as shown below:

(71)



Once again, the sentence is about a certain state going on at a contextually relevant past tense.

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