Building imperfect counterfactuals[*]

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1 Introduction

This paper is concerned with the ways that natural languages mark counterfactual clauses (sometimes also called *subjunctive* clauses), specifically the use of *imperfective* morphology in counterfactuals.

The goals of the paper are two-fold. First, I aim to give a preliminary description of a small number of languages where counterfactual clauses do indeed appear to be marked by imperfective alone, without any other obligatory temporal marking—in particular, without obligatory past tense, contra the typological generalization made in Iatridou (2009). Second, on the basis of such languages I take up the question of whether imperfective aspect can be seen as making a direct semantic contribution to counterfactual interpretations, or whether the occurrence of imperfective is more or less incidental.

In the latter part of the paper, I compare the counterfactual use of the imperfective to other instances of temporal-modal repurposing, and in that context discuss how the temporal relation expressed by imperfective aspect might extend into the modal domain of relations between sets of worlds. I outline the idea that both imperfective aspect and counterfactual modality might involve a non-final subset relation between ordered sets, intervals in the temporal domain and ranked accessible worlds in the modal domain.

2   Background

It has been widely documented that many languages use temporal morphology to mark counterfactual clauses, in particular *past* morphology (Anderson, 1951; Hale, 1969; Isard, 1974; Steele, 1975; Lyons, 1977; James, 1982; Palmer, 1986; Fleischman, 1989; Iatridou, 2000; Van Linden and Verstraete, 2008, among many others). This use of the past tense, exemplified in (1) for English counterfactual conditionals[1], has been the focus of much theoretical work.

(1)   a.   If it had rained yesterday, we could have put off shovelling the driveway.
      b.   If it was raining now, we could put off shovelling the driveway.
      c.   If it rained tomorrow, we could put off shovelling the driveway.

This use of the past tense if often referred to as "fake", following Iatridou (2000), in the sense of not contributing its usual temporal interpretation. Analyses of past morphology in counterfactuals can be broadly divided into two categories: (i) proposals in which temporal past semantics are involved in composing counterfactual meanings (e.g. Ippolito, 2006, 2013; Arregui, 2004, 2009), and (ii) proposals that the "past" of counterfactuals is non-temporal, instead expressing a relation of remoteness or non-coincidence between worlds (e.g. Bjorkman and Halpert, 2013, in press; Karawani, 2014, Ritter and Wiltschko, 2014, Schulz, 2014).

While English requires only past marking in counterfactuals, however, it has been claimed that many languages also require a similarly "fake" *imperfective*. Most attention has been given to languages that require imperfective *in addition* to past marking in counterfactuals: based on a survey of 14 languages, Iatridou (2009) suggests that fake aspect in counterfactuals is always imperfective, and that fake aspect occurs only in languages that also have fake tense. Both these typological claims have been challenged, however: Halpert and Karawani (2012) and Karawani (2014) argue that counterfactuals in Palestinian Arabic actually require fake perfective, while Bjorkman and Halpert (in press) suggest that in Persian and Hindi-Urdu counterfactuals are marked by imperfective alone.[2]

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[1]The conditional in (1c) is not technically counterfactual, as it refers to a future situation. I nonetheless follow Iatridou (2000) and much subsequent work in using the label "counterfactual" or "future-oriented counterfactual" to refer to such conditionals, called *future-less-vivid* by Iatridou, borrowing the term from the traditional grammatical literature. This terminology reflects the fact that future-less-vivid conditionals pattern morphosyntactically with the true counterfactuals in (1a-b) (not only in English but cross-linguistically). I use the term "counterfactual" rather than "subjunctive" to avoid the latter's morphological implications: while all (or nearly all) languages have a way of expressing counterfactual statements, most lack a morphological subjunctive, or have a subjunctive but do not use it in counterfactuals.

[2]Bjorkman and Halpert (2013, in press) also argue that in languages with fake past, fake imperfective can be illusory, arising not from the actual semantic or syntactic specification of imperfectivity, but instead because imperfective is in some languages is the "unmarked" or default aspectual specification for past

This paper further pursues the claim from Bjorkman and Halpert (in press) that some languages mark counterfactuals with imperfective morphology alone. If these languages in fact exist, then they raise some of the same questions that have been previously asked for counterfactual uses of past:

- Does imperfective aspect contribute to counterfactual semantics?

- If yes, is it the ordinary temporal semantics of imperfectivity that is involved, or an extended modal meaning?

- If no, can imperfective morphology be understood as a kind of "free rider" that ends up in counterfactual contexts without directly contributing to counterfactual semantics?

In addressing these questions, I begin in section 3 with a slightly expanded review of languages where counterfactuals do in fact seem to be marked by imperfective alone. In our previous work, Claire Halpert and I discussed only two such languages, Hindi-Urdu and Persian. Some other authors have argued for a connection between imperfectivity and counterfactual or "irrealis" clauses (e.g. Lazard, 1998; Fleischman, 1995), but they have focused on *past* counterfactuals, so that it is difficult to separate the possible contribution of the imperfective from the contribution of past tense.[3] Here I add the languages Mangarayi and Badiaranke to the previously-discussed Persian and Hindi-Urdu, concluding that this pattern of counterfactual marking can indeed be found across unrelated languages, though it is substantially less common than past marking of counterfactuals. Section 4 then discusses the implications that such languages have for our understanding of how temporal categories can be used to express modal meanings; while I do not develop a formal analysis, I argue that the temporal relation expressed by imperfective aspect has a potential analogue in the relation between worlds expressed in counterfactuals.

3   Imperfective-marked counterfactuals

As mentioned in the introduction, most discussions of the association between counterfactuals and imperfective aspect have focused on languages where counterfactuals appear with specifically *past* imperfective marking. One such language is Greek, where the past perfective is ungrammatical in counterfactual contexts, even with apparently perfective interpretations:

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tense (and that fake perfective in Palestinian Arabic arises from the same mechanism, with perfective being the default aspect in the past tense in Arabic).

[3]Van Linden and Verstraete (2008) actually argue for an association between counterfactuals and *perfective* marking. This appears to be an artefact of the fact that they also limit their attention to past counterfactuals, where perfective is often used to express past shifting in a modal or counterfactual context.

(2) a. An efevɣes   avrio   θa eftanes   eki tin ali   evδomaδa
         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 efiɣes   avrio   θa eftases   tin ali   evδomaδa
         if   leave.PST.**PFV** tomorrow FUT arrive.PST.PFV   the other week
                                                         [*Greek: Iatridou, 2000, ex. (21)*]

Other languages where counterfactuals require the past imperfective include French and
Italian (among other Romance languages), and Warlpiri (Legate, 2003).[4] Most authors
have proposed that imperfective in these languages does not contribute directly to coun-
terfactual semantics, but instead occurs because modals require imperfective (Ferreira,
2011), because counterfactuals involve a dissociation between evaluation and event time
that conditions imperfective (specifically habitual) morphology (Iatridou, 2009; Arregui,
2009), or because the "past imperfective" is simply the realization of a syntactic PAST
feature, without any necessary specification for aspect (Bjorkman and Halpert, 2013, in
press).

If imperfective aspect does not contribute to counterfactual interpretations, we might ex-
pect that no language could mark counterfactual clauses with imperfective alone, without
additional past or modal marking. And yet, there are some languages where counterfac-
tuals do appear to be marked by imperfective morphology only. Such languages are not
common, but they are attested, and they suggest that imperfective aspect, like past tense,
can be implicated in the composition of counterfactual meanings. This section briefly de-
scribes the patterns of "fake" imperfective found in Persian, Hindi-Urdu, Mangarayi, and
Badiaranke.

3.1 Persian

In Persian, counterfactuals are marked by the imperfective verbal prefix *mi-*, together with
the so-called "past stem" form of the verb:

(3) 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

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[4]Zulu also requires an apparently past imperfective prefix in counterfactuals (or else a dedicated coun-
terfactual marker), but allows this morpheme to co-occur with a perfective suffix (Halpert and Karawani,
2012).

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mi-kard-am
DUR-do.PAST-1SG
"If I knew the answer now, I would be very proud (lit.: take pride a lot)"
[*Persian: Iatridou 2009, data p.c. from Arsalan Kahnemuyipour*]

The same prefix occurs in non-counterfactual imperfectives, allowing both habitual and progressive interpretations. As we see in (4), however, these non-counterfactual uses of the imperfective prefix do *not* co-occur with the past stem:

(4) 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)"

Based on this, Iatridou (2009) concludes that counterfactuals in Persian are marked by both past and imperfective, patterning with Greek and the Romance languages. Bjorkman and Halpert (in press) observe, however, that the past stem occurs in several non-past contexts in Persian, and so is not obviously a semantically past tense form.[5] First, the infinitive and the perfect participle in Persian are both formed from the past stem (Farahani, 1990). Second, the formal future, illustrated in (5), involves the past stem under the verb *want*.

(5) a. Sârâ daru-hâ-yaš râ   xâh-ad   xord
         S.   medicine-PL her-ACC want.3SG eat.PAST
         "Sârâ will have her medicine."   [*Persian: Taleghani 2008, ex. (30)*]
     b. xâh-am   raft
         want-1SG go.PAST
         'I will go.'   [*Persian: Maziar Toosarvandani, p.c.*]

Finally, in colloquial Farsi, a simple past stem can receive a prospective interpretation, illustrated in (6), which again is non-past.

(6) a. raft-am
         go.PAST-1SG
         'I went' / 'I'm about to go.'   [*Persian: Maziar Toosarvandani, p.c.*]

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[5]Kahnemuyipour and Megerdoomian (2002) also argue that the past stem in Persian is not semantically past, though without reference to its use in counterfactual clauses.

Taken together, these facts suggest that this stem form occurs in non-present contexts, rather than those that are semantically or syntactically specified for past tense. Indeed, this stem can also occur in non-past, non-counterfactual conditionals (Farahani, 1990; Toosarvandani, p.c.), further suggesting that its occurrence in counterfactuals is not related to an association between morphological past and counterfactuality.

3.2   Hindi-Urdu

In Hindi-Urdu, counterfactuals are marked by the habitual morpheme *-taa*. The data in this section are drawn from Bhatt (1997).[6] In present-oriented counterfactuals, this can result in double marking, as in (7a), where two instances of the habitual appear, one with its usual temporal/aspectual interpretation and the other marking the counterfactual. In (7b), the counterfactual-habitual appears above the progressive auxiliary.

(7)   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'.'
           [*Hindi-Urdu: Iatridou 2009, (15), (12)*]

In simple main clauses, habitual *-taa* must always occur with an overt past or present tense auxiliary, as seen in (8):

(8)   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

                             [*Hindi-Urdu: Bhatt 1997, ex., (11d)*]

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[6]Bhatt cites several other Indo-Aryan languages as showing similar patterns, but does not provide examples.

Bhatt (1997) suggests that in counterfactuals—and in some other environments—habitual -*taa* is licensed by a covert past tense operator. This is based on the observation that when a bare habitual form is possible (i.e. without a tense auxiliary), it is interpreted as a past habitual.

3.3 Mangarayi

Mangarayi is language spoken in the Northern Territory of Australia. The description of Mangarayi in this section, and all examples, are drawn from Merlan (1981).

Mangarayi marks a contrast between realis and irrealis mood; negative sentences are treated as forming a third mood, as the realis/irrealis distinction is lost in negative clauses.

(9) a. ja -∅ -ŋani -yug
         3 3SGtalk AUX
         'He is talking.' (=present realis)
     b. (y)a -∅ -ŋani -yug
         IRR 3SGtalk AUX
         'He might talk.' (=present irrealis)
     c. dayi -∅ -ŋani -yug
         NEG 3SGtalk AUX
         'He is not talking.'   [*Mangarayi: Merlan, 1981*]

Of interest to us here is the prefix *(y)a* in (9b), which occurs not only in irrealis clauses but also in semantically realis habitual clauses. This can be seen by comparing the habitual clauses in (10) with the future-oriented irrealis clauses in (11) (which appear to roughly correspond to future-less-vivid interpretations).

(10) a. jibibi   a-   ŋ   aḻa- gawa   -gawa -ma   -n   gayara
          mussels HAB -INCL.PL dig -REDUP -AUX -PRES upriver
          'We always dig mussels upriver.'
      b. ṇa -gabud -mayin buṇaŋ -bayi wa- ∅   -ṇu -ṛa -n   ŋajgan -gan
          3M -black -QUAL evening -FOC HAB- 3SG- sit -AUG -PRES scrub -LOC
          'The black one always sits in the scrub at evening.'
          [*Mangarayi: Merlan, 1981*]

(11) (Note: these examples form one continuous text.)
      a. marʔ ya   -wuja -bana wanbiribiri
          build IRR 3PL   AUX   paperbark
          "They could make a paperbark float,"

b. a -ŋiyan -ga -n
   IRR 2SGA/1EXCL.PLO take PRES
   "you could take us,"

c. a ŋir -yuʔyu -ma malga biraran
   IRR 1EXCL.DU swim AUX up-to Biraran
   "she and I could swim up to Biraran,"

d. gi -nara bundal a -pa -yiri-wa -n
   ANAPH that billabong IRR 2SGA-3SGO see AUX PRES
   "you could look at that billabong (mentioned before),"

e. ya -wuja -guray -ma
   IRR 3PL paddle AUX
   "they could paddle." [*Mangarayi: Merlan, 1981*]

I have preserved Merlan's glosses, which distinguish the habitual in (10) from the irrealis in (11), but the verbal morphology is in fact identical between the present irrealis and the present habitual verb forms.

It should be noted that irrealis mood in Mangarayi is not strictly counterfactual. In particular, Merlan reports that the irrealis is used in past narratives to express a reportative or indirect evidence interpretation—though Merlan does not comment on whether a counterfactual interpretation is possible. The irrealis/habitual marker is also identical to a "generalized subordinate marker" in the language.

Despite not being strictly counterfactual, however, the present irrealis in Mangarayi also occurs in contexts expressing desire or intention, as with the desiderative suffix *-wu* in (12), a potential parallel to the use of counterfactual past under predicates like *wish*:

(12) ṇur -yag mayawa, ṇur -wawaṇi ṇa -juya-wu ŋaṇya ṇa
     2DU go now 2DU forage PURP meat 1INCL.PL.DAT PURP
     -mawuṇ -gu **a** -nur -miʔmi -wu
     vegetable-food IRR 2DU search DESID
     "You two go now, forage for meat for us, you must look around for vegetable foods."

The present irrealis is also apparently commonly found in the "avoidance style" used with certain classes of relatives, essentially as a politeness form, again paralleling a use of counterfactual *would*. These further parallels appear to justify considering the Mangarayi facts alongside the counterfactual uses of imperfective morphology seen above for Indo-Aryan languages.

3.4 Badiaranke

The final language to be discussed here is Badiaranke, spoken in Guinea and Guinea-Bissau. The description of Badiaranke and all examples in this section are drawn from Cover (2010).

Imperfective in Badiaranke is marked by a set of agreement prefixes (while the perfective involves agreement suffixes). In the third-person singular, the relevant prefix is *mp-*. Imperfective clauses can receive either progressive, habitual, or generic interpretations, depending on context.

(13)   ha: to: mpə-   pe:s.
       until today 3SG.IMPF- sweep
       'Shes still sweeping.'   [*Badiaranke: Cover, 2010:70*]

(14)   birĩ dunia: sẽ   fẽt-   ə̃   pi:sido: pidʒaːda pẽ mpə-   bədd-
       since world DET begin- 3SG.PERF every.day sun   DET 3SG.IMPF- go.out-
       u: de
       VENT AFF.DECL
       'Since the world began, every day the sun comes out.   [*Badiaranke: Cover, 2010:72*]

Imperfective clauses can also receive future interpretations; Cover (2010) reports that this is in many cases the most natural interpretation for imperfective clauses with the marker *de*, if a habitual interpretation is not favoured by context, while progressive interpretations obligatorily lack *de*.

(15)   nəse nə̃ mpə-   tʃimə de   (maːtʃim).
       child DET 3SG.IMPF- sing   AFF.DECL song
       'The child will sing (a song)."
       ≠'The child is singing (a song).'   [*Badiaranke: Cover, 2010:75*]

(16)   (kup̃ia) nĩ   mpə-   ra: fe lekol mpə-   dam- o: de   fe fa:se.
       tomorrow if/when 3SG.IMPF- go p school 3sg.impf- kill- pass aff.decl p path
       'Tomorrow when hes on his way to school, hell get killed.   [*Badiaranke: Cover, 2010:75*]

In addition to expressing imperfective aspect and futurity, the imperfective agreement prefixes also occur in the *consequent* of counterfactual conditionals. In (17) the consequent also contains the past suffix -*akəd*,[7] but according to Cover:

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[7]This suffix apparently occurs only in counterfactuals; simple imperfectives otherwise do not allow past

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> In consequents of counterfactuals, the irrealis past suffx -akəd- is often judged optional, but mp- is required.[footnote: Unless a modal verb (e.g. *tʃoom-* 'must') is present, -akəd- is required for a counterfactual interpretation, but it may occur in either the antecedent or the consequent (or both)."]

Despite this quote, all counterfactual examples in Cover (2010) do appear to contain the imperfective past suffix.

(17) nĩ jã padʒeːna teː-   pə- reː wẽ mpə-   das- akəde
      if here night   REL.IMPF- IMPF- come DET 3SG.IMPF- laugh- PAST.IRR.NPERF
      de.
      AFF.DECL
      'If s/he were here this coming night, he would have laughed (but s/he definitely cant come).'   [*Badiaranke: Cover, 2010:77*]

It is also possible for "real" imperfective to occur in conditionals, as in (18):

(18) nĩ   səm- ə̃   Aamadu mpi-   tʃimə, Mariaama mpə-   kamə.
      if/when arrive- 3SG.PERF Aamadu 3SG.IMPF- sing   Mariaama 3SG.IMPF- dance
      'If Aamadu sings, Mariaama will dance.' (future)
      or 'If/when Aamadu sings, Mariaama dances.' (habitual)   [*Badiaranke: Cover, 2010:77*]

Finally, this same imperfective has an epistemic use, with a meaning glossed by Cover as 'I strongly suspect X is the case, but I wouldnt swear to it.' This is exemplified in (19):

(19) katʃud- eː toː sẽ mpə- duːdə fe Amerik.
      morning- of today DET 3SG.IMPF- enter P America
      'This morning shell likely have entered America.'   [*Badiaranke: Cover, 2010:79*]

Cover argues that the various uses of the Badiaranke imperfective share that they all express that an eventuality "is judged likely to be realized based on contextually varying criteria, but might not ever be realized in the actual world" (90). For core imperfective uses (progressives, habituals, generics), this likelihood can be understood in terms of the imperfective paradox, while for future uses Cover appeals to the intuition that future events, however, likely, are modally unsettled.

In developing this analysis, Cover discusses counterfactuals only briefly (p. 99), suggesting

marking in Badiaranke; past imperfective meanings are expressed by means of a periphrastic auxiliary construction.

that it is the modal semantics of the imperfective that allows it to occur in both counterfactual and non-counterfactual conditionals.

3.5 Interim summary

In this section we have reviewed several languages that do indeed appear to mark counterfactuals with imperfective alone, without any necessary role for past tense, contra Iatridou (2009). This suggests that imperfective aspect may in fact play a direct role in the construction of counterfactual semantics.

At the same time, this pattern is strikingly rare, especially in comparison with languages where past tense can be found in both present- and future-oriented counterfactuals. The languages discussed here are the only examples I have found of counterfactuals marked by imperfective alone (setting aside the possibility that it is relatively common within the Indo-Aryan language family).

So the question raised by these languages is in fact two-fold:

- Is imperfective indeed directly responsible for counterfactual semantics in these languages?
- If yes, why is this strategy not more typologically common?

The next section takes up the first of these questions, relating the use of imperfective aspect to other cases where temporal morphology is used to express modal meanings.

4 Counterfactual imperfective and modal repurposing

How should we understand the use of imperfective morphology in counterfactuals? This section does not offer a conclusive answer to this question, but relates it to the broader phenomenon of what we might call modal *repurposing* (see also Bjorkman, Halpert, and Karawani, 2015): the extension of morphosyntax from other domains to modal contexts.[8]

It is common for temporal morphology to undergo modal repurposing, not only in past and imperfective counterfactuals, but also in the common use of the perfect to express indirect evidentiality (Izvorski, 1997; Bjorkman, Halpert, and Karawani, 2015). But much the same phenomenon arises in non-temporal domains, for example in the reported use of distal morphology to mark counterfactuals (Nevins, 2002), or in the cross-linguistically

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[8]Repurposing is essentially a type of grammaticalization. I avoid the latter term, however, because of its association with a specific theoretical framework, e.g. in the work of Haspelmath (1992) Heine (1993), Hopper and Traugott (1993), among others.

common use of possessive morphosyntax to express modal necessity (e.g. Bjorkman and Cowper, 2016).

Focusing on the repurposing of temporal morphology, the question is how morphology that originally had only a temporal use, relating times or events, can come to be used in modal contexts, which instead involve relations among (sets of) worlds. There are at least three types of answers that can be given to this question:

1. Repurposing reflects abstract similarities between temporal and modal relations (e.g. past tense≈modal remoteness).

2. There is no repurposing. In modal contexts, tense or aspect have the same temporal semantics they have in their non-modal uses. The *appearance* of repurposing arises from temporal categories being applied to modal predicates, *or* from a misanalysis of the relevant morphosyntactic categories in a given language.

3. Repurposing reflects the use of tense or aspect category to pragmatically convey (e.g. through implicature or strengthening) a modal meaning, despite a purely temporal semantics.

Each of these may turn out to be correct for some instance of repurposing. The debate over counterfactual uses of past has been between the first two of these options, for example, while the consensus view of counterfactual imperfective has been some version of the second. Ferreira (2011, 2015), for example, proposes that imperfective aspect occurs in counterfactuals because counterfactuals involve a stative modal predicate, and imperfective is the aspect that marks stative predicates (building on Iatridou's generalization that the imperfective that occurs in counterfactuals is always habitual, never progressive, in languages that distinguish progressives from habituals). Taking a slightly different perspective, Arregui (2004) suggests that imperfective occurs in counterfactuals because *perfective* aspect is semantically incompatible with counterfactual interpretations. Iatridou (2009), meanwhile, suggests that imperfective aspect, at least in habituals, reflects a dissociation between the time of evaluation of a clause and the time at which an event takes place, a dissociation that is also found in counterfactual contexts. In none of these cases is imperfective aspect directly involved in the composition of a modal or counterfactual interpretation—this is taken to arise independently from the interaction of a modal with past tense.[9]

A common feature of the languages in section 3, however, is that the counterfactual clauses involve neither past tense *nor* an overt modal (the exception is Badiaranke, where counterfactual imperfective must co-occur with *either* past tense or a modal). It is of course

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[9]The exception is Grønn (2008), who discusses a counterfactual use of the past imperfective that is limited to Russian chess annotations. Grønn argues that this arises as a pragmatic effect of the contrast between perfective and imperfective.

possible that these languages in fact build counterfactuals from null past and modal operators, with overt imperfective the only morphosyntactic indication of the null operators' presence. But given that imperfective aspect is the sole overt marker of counterfactuality, we should at leastseriously consider whether we could attribute counterfactual semantics, to imperfective aspect itself, whether wholly or only in part.

It is not immediately obvious, though, what part of counterfactual semantics the imperfective could give rise to—and if no plausible candidate can be found, then we must fall back to the position that the occurrence of imperfective aspect in counterfactuals is essentially epiphenomenal.

While specifically *counterfactual* repurposing of the imperfective is quite rare, however, what may be more common is the use of imperfective not specifically to express counterfactuality, but more generally to express *futurity*. Cover (2010, 104) cites this as being common in Atlantic languages, including Pulaar, Wolof, Balanta, Kisi, and Mani. Bybee et al. (1994) similarly mention 11 languages in their sample where a present imperfective can be used to make statements about the future, at least given appropriate context.

Future morphology is an extremely common component of counterfactual morphosyntax, especially when combined with past marking (or with exclusively counterfactual morphology). There is moreover essentially unanimous agreement that the future contributes its standard modal semantics to counterfactuals: this is not an instance of repurposing, however repurposing is understood. So it could be that imperfective aspect contributes *future-oriented modality* in the composition of counterfactual semantics.

In Badiaranke this is extremely plausible: we saw that imperfective morphology does indeed have simple future uses in this language. For the other languages under consideration, however, it is a less natural proposal: Hindi-Urdu, Persian, and Mangarayi all have morphological futures that are not identical to the relevant imperfective marker.

Technically speaking, however, what is necessary for this proposal is not that the imperfective and the future be identical, but that the imperfective be able to express a type of modality that is the best fit for the type of modality found in counterfactuals. The remainder of this section explores this proposal, and sketches what the strongest version of it would seem to be. What remains for future work is to investigate individual languages more carefully to test the implications of the proposal below.

So let us consider the possibility that imperfective aspect directly expresses modality in counterfactual clauses, specifically a type of future-oriented modality.

One possibility would be that imperfective aspect *always* expresses future-oriented modality. Indeed, a standard analysis of the so-called imperfective paradox (Dowty, 1977, et seq.) holds that the imperfective—particularly the progressive—is intrinsically modal. The challenge, though, is that this modal content is not the primary semantic contribution

of the (temporal) imperfective. Adopting a roughly Neo-Reichenbachian view of aspect, the imperfective assumed to express a relation between two times, such that one time (the reference or topic time) is a subinterval or the other (the event or situation time). It is precisely this temporal relation that does not appear to be expressed in counterfactual modal contexts.

This leaves us with the possibility that the counterfactual use of the imperfective is a true instance of repurposing. The occurrence of a particular morphological expression M in temporally imperfective and modally counterfactual (or future) contexts does not reflect any literal semantic identity between those contexts, but instead reflects some more abstract similarity.

What type of "abstract similarity" can give rise to a common morphology despite semantic differences? I assume a *realizational* view of the relation between syntax and morphology, as in Distributed Morphology (Halle and Marantz, 1993, 1994; Harley and Noyer, 1999). What this means is that syntax does not directly manipulate either words or morphemes, but instead operates over abstract representations including lexical roots, functional heads, and the formal features of those functional heads. Syntactic representations are then the input to both semantic interpretation and morphological realization—and, crucially, morphological realizations can be *underspecified*, so that morphology underdetermines the set of features present in the syntax.

To give a somewhat more concrete example, the morphological presence of present-tense third-person singular *'s* in a sentence like (20) does not necessarily indicate that either PRESENT or 3SG occur in the syntax. It could instead be the realization of a Tense^0 node in the absence of any more specific features, such as PAST or 1 or PL.

(20)   There**'s** six books on the table.

How is this relevant to modal repurposing? It clarifies that the relationship between morphology and semantics is *indirect*. Neither morphophonological realizations nor semantic denotations occur in syntactic representations. Syntax instead contains formal features, which are the input to morphology and syntax.

So what does this allow us to say about counterfactual uses of the imperfective? Let us assume that imperfective morphology is the realization of a syntactic feature IMPERFECTIVE. In its canonical temporal use, this feature is interpreted as expressing a relation between times (or perhaps between events). The simplest idea, from a repurposing perspective, is that the modal use of the imperfective involves the same relation, but between arguments of a different semantic type. In the modal domain, the relevant argument type is not times, but instead sets of worlds.

What result would we expect if we applied the relation expressed by temporal imperfectivity

to sets of worlds? On the Kratzerian approach to modal semantics, modals express a relation between two sets of worlds: a set of worlds in which a proposition holds, and a set of accessible worlds, the latter set ranked according to some criterion (Kratzer, 1981, 1991). Modal operators express quantificational meanings, combining first with the set of accessible worlds, and then with the set of worlds corresponding to the proposition. Modals thus at least share with viewpoint aspect that they relate two arguments of the same type.

But do modals and aspects express the same types of relations between their arguments? In fact they appear to. As mentioned above, viewpoint aspect expresses subinterval relations between time spans. If we view intervals of sets of times, then the subinterval relation is essentially the subset relation. Modals, meanwhile, involve subset relations between sets of worlds. This means that the relation expressed by the imperfective should be translatable into the modal domain.

As stated above, the imperfective combines first with an event time (ET), then with a topic time (TT), and expresses that its first argument is a superinterval of its second argument. If we simply translate this directly, a modal "imperfective" would combine first with a set of ordered accessible worlds ($B(w)$), then with a set of worlds corresponding to a proposition ($P(w)$), and would express that $B(w)$ is a superset of $P(w)$. This is, in fact, the relation between $B(w)$ and $P(w)$ involved in modal possibility.

	1st Argument		2nd Argument		Relation
Temporal Impf:	Event Time	+	Topic Time	$\rightarrow$	TT is a subinterval of ET
	$\downarrow$		$\downarrow$		
Modal (?) Impf:	B(w)	+	P(w)	$\rightarrow$	P(w) is a subset of B(w)

The perspective on modal repurposing adopted here thus leads us to expect that morphology expressing temporal imperfectivity might be extended to express modal possibility. We are now left to ask whether this can account for the extension of imperfective morphology to future or counterfactual contexts.

The prospects for this are not initially bright: futures are typically viewed not as possibility modals but as necessity modals. But, of course, just because future *will* is viewed in terms of necessity does not mean that future meanings could not be expressed in terms of possibility in other languages. Indeed, Cover (2010) proposes that the future use of the imperfective in Badiaranke results from a semantics of modal possibility.[10]

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[10]Interestingly, there is an expanding future-oriented use of the simple present in English—arguably an imperfective verb form—that appears to be licensed by possibility modals such as *hopefully*, but not by necessity modals such as *certainly*:

(i)   a.   Hopefully nobody faints during the heat wave.
        b.   *Certainly nobody faints during the heat wave.

(ia) is not a futurate use of the present, in that it does not express a schedule or plan. This usage appears

So it is not totally implausible that possibility could give us futurity, but can we find a closer connection? Perhaps we can, by considering that imperfectives are commonly held to require not simply that the topic time be a subinterval of the event time, but that it be a *non-final* subinterval (e.g. Mittwoch, 1988).

If imperfective aspect indeed places a non-finality requirement on the subinterval relation, then it could not be transposed into the simplistic superset/subset definitions of modal relations that I outlined above, precisely because it requires that the members of the sets be ordered. A crucial component of the Kratzerian view of modality, however, is that modality does in fact involve an ordering imposed on the worlds within at least one of the sets involved. Modal necessity does not in fact state that all of the accessible worlds have some property, but instead only that the *best* accessible worlds, ranked according to some criterion, have that property.

With this in mind, we have a somewhat different expectation of what the modal relation derived from a temporal imperfective would be: the worlds in which a proposition holds are a subset of the ranked accessible worlds, but a *non-final subset*, i.e. excluding the most highly ranked worlds.

Now we have finally arrived at a meaning that could plausibly correspond to counterfactuality, or at least something very like counterfactuality. The next step would be to confirm whether the languages that exhibit an imperfective counterfactual form do indeed have temporal imperfectives that express a non-final interval relation. I have not yet had the opportunity to do this.

4.1   Remaining questions

There are at least two remaining questions that would need to be addressed in moving this research program forward. The first is, again, why it is so relatively rare for temporal imperfectives to be repurposed to express counterfactuality. Nothing in the above discussion bears directly on this question: at this point all that is possible is a speculative remark that the relevant similarity between imperfectivity and counterfactuals is somehow not as salient as, for example, the similarity between past and counterfactuality, so that speakers are less likely to make the extension in this case.

The second outstanding question is whether the above discussion has any bearing on those languages where both past and imperfective morphology occur in counterfactuals. Bjork-

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to be accepted by younger speakers, at least in NA, but is rejected by older speakers. The set of contexts that license this use of the simple present is described in Cowper et al. (in prep.): they appear to include clauses modified by (some) modal adverbs, the consequents of future-oriented conditionals, future-oriented questions, clauses embedded by some modal or negative verbs (e.g. *think*, *doubt*), and some clefts.

This does not show that the future in English involves possibility, but it does point intriguingly towards a possible connection between futurity and modal possibility.

man and Halpert (in press) argue that such imperfectives should be uniformly viewed as illusory, an accidental morphological result of the expression of counterfactual past in languages where there is no aspectually-neutral morphological past tense. Does this proposal need to be re-evaluated, if the imperfective can in fact contribute counterfactual semantics more directly.

I suggest that the answer to this question is no, and that our earlier conclusion—that in languages where past and imperfective appear to co-occur in counterfactuals, only one or the other is actually syntactically and semantically present—should be maintained. There are empirical and conceptual reasons for this. On the empirical side, the consideration is typological: languages that require both past and imperfective in counterfactuals are uniformly those where the imperfective is morphosyntactically default in the past tense, while languages that require both past and perfective are those where the perfective is similarly default in the past tense.

On the conceptual side, the consideration is essentially syntactic and representational. Counterfactual clauses, in the sense I have been using it in this paper, are not clauses with a particular interpretation, but instead clauses with a particular morphosyntactic character as well. In other words, counterfactuality can be viewed as a *clause type*. If clause type is indeed a syntactic property, it should be encoded in terms of formal features—and for reasons of economy, it should be encoded by a *single* feature, rather than by a combination of partially- or fully-redundant features.

Note that this argument assumes that imperfective and past each potentially express counterfactuality themselves, rather than occurring in counterfactuals for incidental reasons, or because either or both expresses its usual temporal semantics (perhaps in a different semantic position than they otherwise occur). In that case, there would be no redundancy in both past and imperfective occurring to express counterfactuality.

5   Conclusions and directions for future work

This paper has taken up the typological association between counterfactuality and imperfective aspect, focusing on languages where counterfactual clauses appear to be marked by imperfective aspect alone, in the absence of any past tense marking.

Section 3 reviewed cases from four languages that appear to meet this description: Persian, Hindi-Urdu, Mangarayi, and Badiaranke. The tentative conclusion of that section was that it is indeed attested for languages to mark counterfactuality with imperfective alone (contra Iatridou, 2009, but that this pattern is surprisingly typologically rare.

The remainder of the paper has discussed in a preliminary way how counterfactual imperfective can be understood. This was presented within the broader context of modal

repurposing, against the assumption that at least in at least some cases where temporal (or otherwise non-modal) morphosyntax comes to be used to express modal meanings, this is the result from the extension of an abstract relational meaning from the domain of times (or time intervals) to the domain of worlds (or sets of worlds).

The conclusion of this discussion was the extension of imperfective aspect to future or counterfactual contexts might submit to an analysis in terms of this kind of repurposing. In particular, the relation expressed by imperfective aspect could generalize to modal possibility if applied to sets of worlds—a possible source for future-oriented modality—or else specifically to counterfactual or non-likely modality, by extending "non-final interval" to "not the most highly ranked worlds".

This paper should not be understood, though, as an attempt to argue conclusively for this type of analysis of counterfactual uses of the imperfective. It is instead intended as a preliminary proposal for how imperfective aspect could be understood as making a semantic contribution to counterfactual semantics (albeit in a repurposed form), against what has come to be the standard generative view that imperfective is at best incidental in the formation of counterfactual clauses.

Much more work remains to be done, both on the formal implementation of these ideas and on the specific languages described above. The claim that these languages—and perhaps others—do mark counterfactual clauses with imperfective aspect alone should be further scrutinized, and the range of interpretations available to imperfectives outside of counterfactuals should be carefully investigated.

6   Conclusion

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