Conditionals without 'if' – tracking conditional meaning across languages

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Part 1: Conditional constructions and conditional meaning

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1 *if* we didn't have you

Linguistic and philosophical investigatons of conditionals take as their point of departure *if*-clauses, which are standardly associated with two meaning components:

1. Speakers uttering *if p, (then) q* are not committed to the truth of p
2. Speakers uttering *if p, (then) q* are committed to the truth of q only { depending on p / for a certain proportion of p-situations}

To exemplify:

(1) *If it is raining, Mary is at the office.*
   a. $\not\rightsquigarrow$ It is raining.
   b. $\not\rightsquigarrow$ Mary is at the office.
   c. $\rightsquigarrow$ Any relevant current hypothetical rain situation is such that Mary is at the office.

(2) *If it is raining, Mary often takes the bus.*
   a. $\not\rightsquigarrow$ It is raining.
   b. $\not\rightsquigarrow$ Mary often takes the bus.
   c. $\rightsquigarrow$ Many of the rain-situations are situations in which Mary is at the office.

The English conditional connective *if* or an obvious counterpart in other languages 'IF' (maybe French *si*, Italian *se*) seems to play a crucial role.

- But why?
- And also, the particular combination of meaning components can be found also in the absence of such a connective IF.

Reference framework: I will assume a world $\times$ times-frame (Thomason, 1984) as a backdrop for our discussion, see Kaufmann (2005) and follow-up work (*–adjustments to happen where details of a specific work are discussed*).

(3) A $W \times T$-frame is defined as a quadruple $\langle W, T, <, \approx \rangle$, where
   a. W and T are disjoint non-empty sets of worlds and times respectively,
   b. the relation of ***temporal precedence*** $<$ linearly orders T (transitive and for all $t \neq t'$, either $t < t'$ or $t' < t$), and
   c. the relation in W of ***historical alternatives*** at t is given by $\approx \subseteq T \times W \times W$ such that (i) for all $t \in T$, $\approx_t$ is an equivalence relation on W, and (ii) forall $t, t' \in T$ and $w, w' \in W$, if $w \approx_t w'$ and $t' < t$,then $w \approx_{t'} w'$ (historical alternatives diminish over time).

(4) I will call $W \times T$ the set of *indices* I. The relations $<$ and $\approx$ are extended to $I \times I$ as follows:
   a. $\langle w,t \rangle < \langle w',t' \rangle$ iff $w = w'$ and $t < t'$.
   b. $\langle w,t \rangle \approx \langle w',t' \rangle$ iff $w \approx_t w'$ and $t = t'$.

(5) An admissible model (***history model***) respects historical alternatives:
A history model for a set of propositional variables $\mathscr{A}$ is a structure $M = <W, T, <, \approx, V>$, where $<W, T, <, \approx>$ is $W \times T$-frame, and $V : \mathscr{A} \to (I \to \{0,1\})$ is a truth assignment for $\mathscr{A}$ such that for all A $\in \mathscr{A}$ and $i, j \in I$, if $i \approx j$,then $V(A)(i) = V(A)(j)$.

Epistemic, deontic, etc. accessibility relations in I are added to the models as needed.

2 Different types of conditional meaning/conditionals

Conditionals are standardly treated as expressing modal (and temporal) quantification restricted by (i) a modal or temporal accessibility relation determined by an overt modal, a quantificational adverbial (q-adverbial), a covert generic operator, or a covert necessity modal in the consequent, as well as (ii) the content of the antecedent.

(6) '*if* ϕ, ψ' is true if and only if ψ is true at the (relevant) points in the domain in which ϕ is true.

Differences on (i) yield a well-known inventory of types of conditionals (non-exhaustive):

- Non-predictive conditionals:

  (7) a. *If Mary is in her office, the lights* { *are / must be* } *on.*
  b. ... is true at $\langle w,t \rangle$ if the lights are on at all $\langle w',t' \rangle$ (i) that are epistemically accessible from $\langle w,t \rangle$ and (ii) at which Mary is in her office.

- Predictive conditionals:

  (8) a. *If Mary comes to the office, the lights will be on.*
  b. ... is true at $\langle w,t \rangle$ if the lights are on at all $\langle w',t' \rangle$ (i) that are historical alternatives of w at t (i.e., $w \approx_t w'$) and $t < t'$, and (ii) at which Mary is in her office.

- Quantificational conditionals (e.g. generic):

  (9) a. *If Mary comes to the office, the lights are usually on.*
  b. ... is true at $\langle w,t \rangle$ if the lights are on at all $\langle w',t' \rangle$ (i) that according to $\langle w,t \rangle$ are relatively normal (ii) among all the $\langle w'',t'' \rangle$ at which Mary is in her office.

- Deontic modals [-*maybe*...]:

  (10) a. *If Mary is in her office, the lights must be on. (We cannot have her sit in the dark.)*
  b. ... is true at $\langle w,t \rangle$ if the lights are on at all $\langle w',t' \rangle$ (i) that are compatible with the relevant rules at $\langle w,t \rangle$ and (ii) at which Mary is in her office.

  It is somewhat disputed that this construal is required. We might be able to reduce the case to (7b) with the deontic modal embedded in the consequent:

  (11) ... is true at $\langle w,t \rangle$ if at all $\langle w',t' \rangle$ [(i) that are epistemically accessible from $\langle w,t \rangle$ and (ii) at which Mary is in her office], [all indices $\langle w'',t'' \rangle$ that are deontically accessible from $\langle w',t' \rangle$, are such that the lights are on].

Frank (1996) argues the necessity of this construal because rules considered in the consequent need not be the ones of the actual world:

(12) *If the new laws go into effect, sales people will have to work longer.*

In Schwager 2006 I call the two options ***overt conditional operator***-construal and ***covert conditional operator*** construal.

- Variation in terms of remoteness from the world of evaluation (***indicative*** vs. ***subjunctive conditionals***), where remoteness in English is marked in terms of single past and double 'fake' past (Iatridou, 2000):

(13) ***Subjunctive conditionals***:
  a. *If Mary came to the office tomorrow the lights would be on now.* 'outlandish possibility'
  b. *If Mary had come to the office tomorrow, the lights would have been on now.* 'counterfactual'

- Puzzling cases that do seem to involve speaker commitment to the consequent, ***biscuit conditionals***, (14a) from Austin (1956)'s example (14a), and ***factual conditionals*** (Iatridou, 1991), (14b):

(14) a. *There are biscuits on the sideboard if you want them.*
  b. *If you like him so much you will surely help him.*

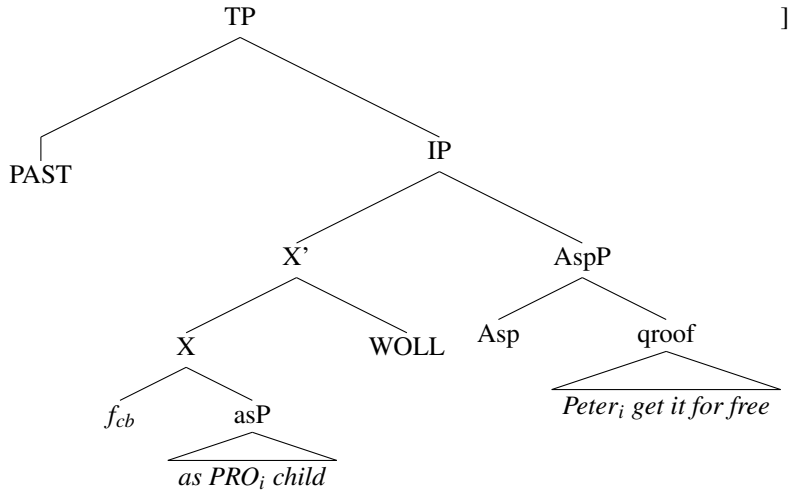
3 Roles to play for IF

3.1 *if*-as interacting with (or embodying) a quantificational operator

- *if* introduces a proposition that restricts some operator, ***Restrictor Analysis*** (Lewis, 1975; Kratzer, 1986, 2012)
  - Accounts for the interaction with modal operators, q-adverbials, generic tense, also nominal quantifiers
  - Requires a covert epistemic necessity modal □ when no overt operator is present:

(15) [*if* ϕ [{ *must* / □ } ψ]

  - Accounts differ in semantic commitments to *why if*-clauses restrict operators:
    * **Just a proposition** Building on lecture notes by von Stechow (2004), Zobel (2018) considers regular predicate modification of a propositional quantificational domain:



Where modals like WOLL quantify over contextually given sets of indices f_{cb} (a proposition), and '*as PRO$_i$ child*' both denote sets of indices, we obtain:

(16) $[f_{cb}$ *as PRO$_i$ a child* $] \rightsquigarrow \lambda t.\lambda w.f_{cb}(\langle w,t\rangle) \wedge \text{child}(x_i)(\langle w,t\rangle)$

A mood-marked proposition Grosz (2011) complementizer *if* spells out Mood-head adjoined to C-head ($\Rightarrow$ syntactically and/or semantically marked for appearing only in the scope of a suitable operator).

∗ **Semantically specified to restrict operators:**
if is a modifier of accessibility relations (Heim and von Fintel, 2011) or additionally expands the accessibility relation forward in time Kaufmann 2005 (for simplicity assuming with Kaufmann that MODALs combine with accessibility relations of type $\rho := \langle s,\langle s,t\rangle\rangle$, instead of Kratzerian conversational backgrounds):

(17) a. $\textit{if} \rightsquigarrow \lambda p_{\langle s,t\rangle}.\lambda R_\rho.\lambda\langle w,t\rangle.\lambda\langle w',t'\rangle.\langle w,t\rangle R\langle w',t'\rangle \wedge p(\langle w',t'\rangle)$
b. $\textit{if} \rightsquigarrow \lambda p_{\langle s,t\rangle}.\lambda R_\rho.\lambda\langle w,t\rangle.\lambda\langle w',t'\rangle.\exists t''[\langle w,t\rangle R\langle w',t''\rangle \wedge t'' < t' \wedge p(\langle w',t'\rangle)]$

- *if* is a two-place connective, ***operator approach*** (Gillies, 2010)

(18) $\textit{if} \rightsquigarrow \lambda p.\lambda q.\forall\langle w',t'\rangle[[\langle w,t\rangle R^{epi}\langle w',t'\rangle \wedge p(\langle w',t'\rangle)] \rightarrow q(\langle w',t'\rangle)]$

Note: Kratzer (1991a) declares the operator approach doomed, based on Gibbard's proof (Gibbard, 1981) that under certain conditions it boils down to material implication (!). However, the proof only goes through if (i) Modus Ponens is valid (which Kratzer doesn't endorse), and (ii) *if* is not context sensitive, that is, stacked *if*-clauses don't affect each other (Kaufmann and Kaufmann, 2015, for discussion).

Restriction of q-adverbials may remain problematic.

How much interaction with a modal is specified may influence treatment of *if*-clauses in other contexts and replacement of *if*-clauses by other

- Extension to standalone occurrences Grosz (2011:his (1)):

(19) a. *Oh that I had told them a year ago!*
b. *If only I had told them a year ago!*

Complement clauses, ***non-logical* if-*clauses*** (e.g. Pullum, 1987; Pesetsky, 1991; Rocchi, 2010; Sode, 2018a,b)

(20) a. *I would prefer (it) if she didn't come to the party.*
b. *It would be good if she came to the party.*

- Non-*if*-marked propositions in the role of *if*-clauses (English subjunctives, German also indicatives, e.g. Bhatt and Pancheva (2006); Grosz (2011)):

(21) a. *Had Kim come to the party, it would have been fun.*
b. *Kommt Kim, wird die Party lustig.*
comes.PRES.IND Kim becomes the party fun
'If Kim comes, the party will be fun.'

Relates to ***Interrogative-conditional-link*** (recent discussion, e.g. Bhatt and Pancheva, 2017; Onea Gaspar and Steinbach, 2012; Williamson, 2019).

Conditional conjunctions, absolutes,... [*more to come*]

3.2 *if* as marking hypothetical updates of belief states

A variety of additional options available in dynamic frameworks [*some specific cases to come*].

3.3 Referential approach: a specific role for IF

- ***Referential approach***: Antecedent *if* ϕ refers to one/a plurality of ϕ-worlds selected w.r.t. to index of evaluation

  Basic idea from Stalnaker 1968 for counterfactuals:

(22) At a world of evaluation w, *if* ϕ selects the world w' closest to w such that ϕ is true, and
(22) *If* ϕ, ψ is true iff ψ is true at the thus selected w'.

(23) A Stalnaker selection function f applies to a world and a set of worlds, and, for any w and A, meets the following conditions:
  a. Condition 1: $f(A,w) \in A$.
  b. Condition 2: $f(A,w) = \lambda$ iff $A = \emptyset$.
  [Where λ stands for an absurd world at which everything and its negation is true.]
  c. Condition 3 (***Centering***): If $w \in A$, then $f(A,w) = w$.
  d. Condition 4: For any A', if $f(A',w) \in A$ and $f(A,w) \in A'$, then $f(A,w) = f(A',w)$.

(24) *If* ϕ, ψ is true at w iff $f([\![\phi]\!],w) \in [\![\psi]\!]$.

- Referents need not be individual worlds:
  - Referring to a plurality of ϕ-worlds selected w.r.t. to index of evaluation (Schein, 2001; Schlenker, 2004; Ebert et al., 2014)
  - Referring to the proposition (set of indices) $[\![\phi]\!]$ itself
  - Referring to $\{[\![\phi]\!]\}$ (to capture the interrogative-conditional link, Williamson 2019)

With *plural referents*, results differ depending on how we combine referential antecedent with the consequent, in particular, we can use it as the restrictor for an operator ⇒ referential accounts are not incompatible with quantificational ones.

- Use the referent for a version of the ***Restrictor account*** (Williamson, 2019)
- Predicate the consequent proposition of the referent of the antecedent referent (i) pointwise, (ii) collectively for non-logical conditionals (Kaufmann, 2018)

Syntactic arguments support a particular version of the referential approach, where *then* is the correlative pro-form for free relatives over worlds (Bhatt and Pancheva, 2006, 2017; Williamson, 2019):

(25) [FREE RELATIVE]$_i$ [. . . PROFORM$_i$ . . .]

Transparently in languages with productive correlativization, e.g. Marathi, from Bhatt and Pancheva (2006:their 65a,b, taken from Pandharipande 1997):

(26) a. (dzar) tyāne abhyās kelā tar to pā hoīl.
if he-ag studying do.Pst.3MSg then he pass be.Fut.3S
'If he studies, he will pass (the exam).'

b. dzo mānūs tudzhya śedzārī rāhto to mānūs lekhak āhe
which man your neighborhood-in live-Prs.3MSg that man writer is
'The man who lives in your neighborhood is a writer.'
Lit. Which man lives in your neighborhood, that man is a writer. '

Note: The distinction between'referential' and 'quantificational' accounts is sometimes associated with monotonicity (whether or not ***Strengthening of the Antecedent*** is valid), in analogy to ***definite descriptions*** (Schlenker, 2004):

(27) If ϕ, ψ..
If ϕ and χ, ψ. Strengthening of the Antecedent

(28) The pig is grunting.
⁄. The pig with floppy ears is grunting.

But all combinations are attested, and the debate about the correct one is on-going. From a semantic perspective, some theories are mutally translatable, but extra-semantic considerations may still play a role.

- Non-monotonic referential (Stalnaker 1968; Schlenker 2004,. . .): choice functions depending on similarity.
- Non-monotonic quantificational (Lewis 1973; Kratzer 1991b, ***variably strict conditionals***): quantification over ordered worlds (or situations, e.g. Fine 2017).
- Monotonic referential (Schein 2001): standard (monotonic) definite descriptions that pick out the maximal set that satisfies its restrictor.
- Monotonic quantificational (von Fintel 1999; von Fintel 2001)[1]: *if*-clauses restrict a universal quantifier (***strict conditional***).

[1]Schlenker writes 'following much of the literature', which is suprising in view of the prevalence of the–non-monotonic–Kratzer-style framework.

The same goes for other treasured/hated theorems of 'the original' (Stalnakerian) referential analysis, like ***Conditional excluded middle*** (CEM):

(29) $\mathit{if}\ \phi, \psi \vee \mathit{if}\ \phi, \neg\psi$

3.3.1 Referentiality and topicality

Referential acccounts of *if*-clauses come handy in explaining the link between conditional antecedents and topicality.

- Conditional antecedents like being topical (Haiman, 1978), and referential expressions make for good topics.
- Ebert et al. (2014) propose that conditional antecedents refer to world pluralities (the sum of all epistemically accessible worlds that verify the antecedent)

  They treat topicalization as a separate speech act of introducing a topical discourse referent:

  (30) $\text{ASSERT}(<\phi_{topic}, \psi_{comment}>) \mapsto \text{REF}_X(w_0, \phi_{topic})$ & $\text{ASSERT}(w_o, \psi_{comment}(X))$ their (50)

  (31) a. $\text{ASSERT}(w, p_{\langle s,t\rangle}) \equiv$ the speaker commits herself to the truth of p in w their (48)
  b. $\text{REF}_X(w, d_{\langle s,\sigma\rangle}) \equiv$ the speaker draws the listener's attention to $d(w)$ their (49)

- They propose that different types of conditionals correspond to different types of topic semantically and syntactically:

  Regular hypothetical conditionals ***'normal' conditionals*** are ***aboutness topics*** and BCs are ***relevance topics***:

  (32) a. If Peter went shopping, (then) there is pizza in the fridge. NC
  b. If you are hungry, (#then) there is pizza in the fridge. BC

  In German, these are distinguished by two types of left dislocation constructions (Frey 2004):

  (33) Den Pfarrer, den kann keiner leiden.
  the-ACC pastor RP-ACC can nobody like
  'The pastor nobody likes.' ***German Left Dislocation*** (GLD)

  (34) Der/den Pfarrer, keiner kann ihn leiden.
  the-NOM/the-ACC pastor nobody can him like
  'The pastor, nobody likes him.' ***Hanging Topic Left Dislocation*** (HTLD)

  Differences between the two types of topics as attested by GLD/NC vs. HTLD/BC

  - Prosodic Integration
  - Resumption (no proform in relevance topics)
  - Binding (quantifiers can bind into GLD and NC, but not HTLD and BC) (example from Ebert et al. 2014; (36b) slightly modified):

    (35) a. Seinen$_i$ Vater, den verehrt jeder$_i$.
    his father, RP-ACC admires everybody

b. *Sein(en)$_i$ Vater, jeder$_i$ verehrt ihn.
his(-ACC) father everybody admires him

(36) a. Wenn man sie$_i$ gut pflegt, dann blüht [jede Orchidee]$_i$ mehrmals im
if one it well groom then blossoms every orchid several.times in.the
Jahr.
year
'Every orchid blossoms several times a year, if you groom it well.'

b. *Wenn Du etwas über sie$_i$ wissen willst, [jede Orchidee hier]$_i$ blüht
if you something about it to know want every orchid
mehrmals im Jahr.
here blossoms several.times in.the year

– Discourse structure: GLD (33), but not HTLD (34) can answer *Any news about the pastor?*; HTLD indicates relevance *as for X*

if ϕ: refers to maximal sum of ϕ-worlds that are compatible with beliefs of the speaker

(37) For a given proposition p and a world w' we define $\mathbf{M}_{w'}$ as follows:
$\mathbf{M}_{w'}(p) := \sigma(\lambda w.p(w) \wedge R_{ep}(w')(w))$ their (36)

(38) If Peter went shopping, then there is pizza in the fridge.
$\text{REF}_X(w_o,\lambda w'.\mathbf{M}_{w'}(\lambda w.\text{go-shopping}(w)(\text{peter}))) \;\&\; \text{ASSERT}(X,\lambda w.\text{pizza-in-fridge}(w))$

(39) [If you are hungry,]$_T$ there is pizza in the fridge.
$\text{REF}_X(w_o,\lambda w'.\mathbf{M}_{w'}(\lambda w.\text{hungry}(w)(\text{listener}))) \;\&\; \text{ASSERT}(w_o,\lambda w.\text{pizza-in-fridge}(w))$

- Referential analysis works particularly well. (Quantificational *if* ϕ may work, too (Endriss 2009 on quantificational topics).

4 Explorations in the absence of IF

Hypothesis: We can make better formed decisions regarding these theoretical choice points when (i) comparing with languages that lack a uniquely identifiable *if*, (ii) comparing with constructions that alternative to *if*-clauses express conditional meaning

Different types of conditional marking strategies differ in

- what types of conditionals can be formed
- what contribution is made by fake tense and aspect marking

Plan for the remainder of this week is to investigate:

- Languages that lack one identifiable IF, because they have too many markers of conditional antecedents
  - Japanese conditional connectives
  - Japanese optional *moshi* (in addition to some conditional connective)
  - Serbian *da* vs. *ako* and their differences in mood marking [*–on-going work with Neda Todorović (University of British Columbia)*]

- Hypothetical meanings arising in the absence of an identifiable IF
  - Conditional conjunctions (in English and across languages) [*–Thursday*]
  - Nepali participle marked conditionals and English absolutes [*–on-going work with Kavya Krishnan (UConn), Friday*]

Advertisement break: Part of on-going NSF project #2116972, "Research on conditional and modal language" [Magdalena Kaufmann/Stefan Kaufmann (Co-PIs), research assistants: Muyi Yang and Teruyuki Mizuno], `https://conditional.linguistics.uconn.edu`. We also provide summaries of Japanese works under 'Resources' (please email me for password).

5 Too many *if*s – Languages lacking a uniquely identifiable *if*

5.1 Japanese and a multitude of *if*s

Japanese forms conditional with antecedent final connectives that are all translated as *if* (for a recent overview in English, see Takubo 2020).

(40) *Mary-ga {ku-ru nara / ki-tara / ku-reba / kuru to / ki-tewa},*
Mary-NOM {come-NPST NARA / come-TARA / come-BA / come-NPST TO / come-TEWA}
John-mo ku-ru.
John-also come-NPST.
'If Mary comes, John also comes.'

- The connectives differ in whether they allow temporal oppositions (PAST vs. NONPAST) and modals in the antecedent (only *nara*), embed fixed NON-PAST (*to*), or no tense morphemes (*-tara, -reba, -tewa*).
- Not all of them are equally felicitous out of the blue
  - *nara* imposes specific requirements on the discourse structure and is infelicitous out of the blue: You arrive at a new campus and are lost on your way to the semester orientation. To a stranger:

    sumimasen. moshi ima nyuugakushiki-no kaijou-ni {#ikare-tei-ru nara / sorry supposedly now orientation-GEN venue-DAT { go-ASP-NPST NARA / ikare-tei-tara} basho-o oshiete itadake-mas-en ka? go-ASP-TARA} place-ACC teach give-POL-NEG QPart
    'Excuse me. If you're going to the orientation, could you tell me where it is?' Yang (2021:her (4))

  In contrast, *nara* is the only connective felicitous in factual conditionals, Akatsuka (????) suggests that it requires that the antecedent has recently be learned:

  (41) A: I have decided to go to the winter LSA.

  B: kimi-ga {ik-u (no) nara / #it-tara / #ik-eba / #ik-u to},
  you-NOM {go-NPST FIN NARA / go-TARA / go-BA / go-NPST TO}
  boku-mo iku yo.
  I-ADD go SFP
  'If you're going, I'm going, too.' from **?**, building on Akatsuka

Yang (2021) shows that the speaker is not committed to the antecedent proposition:

(42) A: Where's the professor?
B: *wakar-anai kedo*, *ofisu-ni i-ru nara*, *boku-mo kiki-tai koto-ga aru*.
know-NEG but office-DAT be-NPST NARA I-ADD ask-want thing-NOM be
'I don't know, but if she's in the office, I also have something to ask her.'

She proposes that an update with *nara* conditional requires that the antecedent is

- ∗ not yet entailed by the common ground [*for her, like any other conditional connective*],
- ∗ the antecedents is entailed by one of the resolutions to whatever issue is currently under discussion (implemented in the ***Table Model***, Farkas and Bruce 2010).

– *tewa* is felicitous only if the consequent (here, John's arrival) is considered an unfavorable course of events

– =*to* and -*tewa* display restrictions in modal flavor, typically infelicitous for epistemic conditionals [*see conditional conjunctions tomorrow*]

- Conditional connectives differ in whether and under what circumstances they do double duty as **temporal adverbial clauses** (Takubo, 2020, for data and references).

- In Japanese, different conditional connectives do not differentiate between degrees of remoteness, compare Hasada 1997:her (9); but fake past does (partly, Mizuno and Kaufmann 2019)

(43) (Moshi) kare ga kanemochi { deare -ba / dat -tara(ba) / nara(ba)
MOSHI he NOM rich { be-(RE)BA / be-TARA / be-NARA }
} kocci o erabu daroo.
this.object ACC choose will/would
'If he is rich, he will choose this.'
'If he were rich, he would choose this.'

In contrast, in Serbian, different connectives can encode differences in remoteness (but don't seem to mark differences in discourse status).

5.2 Serbian connectives distinguish modal remoteness

Warning: work very much in progress.

- In Serbian, (Kaufmann and Todorović, 2022), the choice of connective *da* over a class containing *ako, ukoliko,...* in itself encodes one step of remoteness (≈ subjunctive marking).

- The finite verbal forms crucial in the following are the commonly used synthetic present, analytic present perfect (semantically present perfect or past) and analytic future, analytic conditional tense:

(44) Ako me pozovu na žurku, ići ću.
AKO I.dat.sg **invite.3PL.PRES** on party go.inf. will.1sg
'If they invite me to the party, I'll go.'
AKO ... PRESENT ..., ... FUTURE/PRESENT

(45) a. Ako bi me pozva-li na žurku, išla bih.
AKO be.3pl.COND I.dat.sg invite-PART.M.PL on party gone.f.sg be.1sg.COND
AKO ... CONDITIONAL ..., ... CONDITIONAL

b. Da me pozovu na žurku, išla bih.
DA I.dat.sg **invite.3PL.PRES** on party gone.f.sg be.1sg.COND
'If they invited me to the party, I'd go.'
DA ... PRESENT ..., ... CONDITIONAL

(46) Da su me pozva-li na žurku, išla bih.
da **be.3pl.PRES** I.dat.sg invite-PART.M.PL on party gone.f.sg be.1sg.COND
'If they had invited me to the party, I'd have gone.'
DA ... PRESENT PERFECT ..., ... CONDITIONAL

Other combinations (apart from tenses used for regular temporal readings) are ungrammatical.

- Following recent literature (e.g., Schulz 2017; Mizuno and Kaufmann 2019; Mizuno 2022, von Prince 2019), we assume that these three kinds of conditionals correspond to three quantificatonal domains:

(D1): (the speaker's/ participants') epistemic alternatives

(D2): a union of epistemic alternatives and their relevant remote/inherently impossible alternatives,

(D3): worlds that can be ruled out based on current knowledge, but that were live epistemic possibilities at an earlier point (i.e. how the world could have turned out).

- Choice of *ako* vs. *da* is semantically significant:
  - (44) vs. (45b): share present indicative in the antecedent
  - (44) and (45b): share conditional tense in the consequent

- Our first stab in terms of an operator approach:
  - Interpretation proceeds relative to a salient information state (Yalcin, 2007) $\Rightarrow$ to account for mood choice
  - Conditional connectives are modal operators evaluated w.r.t. a salient accessibility relation R, which they
    (i) extend forward in time to
    $R^* = \{ \langle i, j\rangle \mid \exists j'[iRj' \wedge j' \leq j\}$ (Kaufmann, 2005)
    (ii) restrict by the antecedent proposition:
    $[\![ako^R]\!]^{D1} = \lambda p.\lambda q.\lambda i.\forall j[[iR^* j \wedge p(j)] \rightarrow q(j)]$
  - The available accessibility relations are (the forward expansions of) the following modal bases (with a stereotypical ordering omitted, for ease of exposition):
    (i) doxastic, which yields $D1$ (i.e., $D1 = \{j \mid iRj\}$),
    (ii) a modal expansion of the doxastic relation, reaching a set $D1'$ of indices $\langle w', t'\rangle$ such that there is some $\langle w, t'\rangle \in D1$ (i.e. a set of epistemically implausible or metaphysically impossible indices co-temporal with an epistemically possible one, where $D2 = D1 \cup D1'$); Mizuno and Kaufmann 2019; Mizuno 2022,
    (iii) the relation accessing the historical alternatives at t (all indices that are indistinguishable up to point t). (Available only for past shifted antecedents with causal intervention, involving a rerun of the history based on retraction of the antecedent's negation Ippolito 2013)

– Connective and tense/aspect marking leave only one domain choice as felicitous.
– Indicative vs. conditional mood: we take the indicative mood to be restricted to indices in the information state (47), whereas conditional mood carries no such restriction:

(47) $[\![ind\ \phi]\!]^S = \lambda i : i \in S.[\![\phi]\!]^S(i)$

– If *ako* is interpreted with respect to the doxastic accessibility relation yielding $D1$, we obtain regular indicative conditionals, with indicative mood on consequent and antecedent (44).
By antipresupposition (Heim's Maximize Presupposition: 'use indicative when you can'), the conditional mood signals modal expansion, and thus salience of an accessibility relation yielding $D2$, (45a).
– *da* has the same basic quantificational structure, but itself contributes the modality layer $D2$ (similarly, Durović 2019).
To reach $D3$, perfect morphology in the antecedent contributes the effect of English double past marking.
We take it to signal past causal intervention (Schulz, 2017; Mizuno and Kaufmann, 2019); it makes salient historical alternatives at a past point as the relevant R and reaches truly counterfactual alternatives in $D3$ ($D3 \cap D1 = \emptyset$).
Problem: these accounts (can) rely on past that outscopes the conditional.

(48) a. [[*untensed radical*-CONDCONN] CONSEQUENT-PAST] Japanese
b. PAST [*if* ...*past*] [WOLL$^{\text{past}}$ ...]] English
c. [[*da* ... PAST] [... VERB^{Conditional}]]

– In *da*-antecedents, indicative marked propositions can be evaluated outside of $D1$.
For the interpretation of expressions in its scope (the antecedent), *da* overwrites the information state parameter with its R, allowing for indicative marked antecedent propositions to be evaluated outside of $D1$, see (45b):

(49) $[\![da^R\ \phi]\!]^S = \lambda q.\lambda i.\forall j[[R*(i)(j) \wedge [\![\phi]\!]^{\{i' | R*\langle i,j\rangle\}}(j)] \rightarrow q(j)]$

- We predict that $D2$ (shown with *ako*) is compatible with antecendents about the present and future (evaluation time and forward expansion), but not the past:

(50) *Ako bi Miloje otišao na žurku juče, žurka bi uspela.
ako be.3sg.aor Miloje gone.m.sg on party yesterday party be.3sg.aor succeeded.f.sg
Int.: 'If Miloje were to have been on the party yesterday, the party would've been successful'

- $D3$ is predicted to be possible with antecedents characterizing any indices from the past intervention point on. However, Durović (2019) observes that future adverbials are more restricted than in English and require focusing (speaker judgments vary):

(51) %Da sam prodala kola SUTRA, bolje bih prošla.
DA be.1SG.PRES sold.F.SG car tomorrow better be.1SG.COND passed.F.SG
'If I had sold my car TOMORROW, I would've gotten a better price'

Tentatively: Serbian requires that the proposition to be reset is overt, and speakers who accept future adverbials with focus are able to access existential closure over focus alternatives (roughly, revisision by $\exists P$[sell-my-car(i) $\wedge$ $P(i)$], for $P \in \{$tomorrow, ... $\}$).

- Countermathematicals with antecedents that cannot result from causal intervention in the past but require considering remote or 'impossible possible worlds' have to be expressed with *D*2-conditionals (Mizuno and Kaufmann, 2019; Mizuno, 2022, for Japanese):

(52) a. Da je 9 prost broj, ne bi bio deljiv sa 3.
da be.3sg 9 simple number not be.3sg.aor been.m.sg. divisible with 3

b. Ako bi 9 bio prost broj, ne bi bio deljiv sa 3.
ako be.3sg.aor 9 been.m.sg simple number not be.3sg.aor been.m.sg. divisible with 3
'If 9 were prime, it would not be divisible by 3.'

c. #Da je 9 bio prost broj, ne bi bio deljiv sa 3.
da is 9 been.m.sg simple number not be.3sg.aor been.m.sg. divisible with 3
like: 'If 9 had been prime, it would have not been divisible by 3.'
(only ok when talking about a salient past occasion, e.g. an exam, at which someone failed to draw the correct conclusion)

5.3 Extra *if*s: Japanese *moshi*

- Japanese possesses an optional antecedent initial marker *moshi* that is also standardly translated as *if* (as well).

- Whenever *moshi* is felicitous in a conditional, it is optional:

(53) (moshi) Mary-ga ku-reba, John-mo ku-ru.
MOSHI Mary-NOM come-REBA John-ADD come-NPAST
'If Mary comes, John also comes.'

- *moshi* can occur with modals:

(54) (moshi) John-ga kur-reba, Mary-mo ku-ru kamoshirenai.
MOSHI John-NOM comes-REBA, Mary-ADD come-NPAST might
'If John shows up, Mary might show up, too.'

moshi cannot occur with q-adverbials like *taitei* 'usually' (Kaufmann, 2018) or in generic conditionals (and forces a narrow scope construal for other operators like *yoku* 'often' and *tokidoki* 'sometimes'):

(55) ??moshi hikouki-ni nor-eba taitei kibun-ga waruku naru.
MOSHI plane-DAT get.on-REBA usually feeling-NOM bad become-NPST
'If I get on a plane, I usually feel sick.' from Yang (2022)

(56) (#moshi) taiyou-ga shizum-eba, yoru-ni naru.
MOSHI sun-NOM sink-REBA, night-DAT become-NPST
'It becomes night if the sun goes down.'

(57) { a.–/b. moshi } hikouki-ni nor-eba, { yoku / tokidoki } kibun-ga waruku naru.
{ a.–/b. MOSHI } plane-DAT get.on-REBA { often / sometimes } feeling-NOM bad become-NPST
'If I'm on a plane, I often/sometimes feel sick.'
R1 (Q-adv-restricing): 'Many/Some situations where I'm on a plane are situations where I

feel sick.' *only a*
R2 (Covert modal-restricting): 'In case I get on a plane, I'll feel sick many times/on and off during that flight.' *ok with a,b*

- Yang (2022) proposes to capture *moshi* in a referential analysis of conditional antecedents, assuming specifically:
  - Conditional antecedents are definite descriptions and plural by default
  - *moshi* enforces singularity.
  - Q-adverbials get restricted by *if*-clauses, but modals are interpreted pointwise at all antecedent worlds.

  She spells the idea out in a dynamic framework with discourse referents for antecedent worlds (***Intensional Plural Compositional DRT***, Brasoveanu 2010):

  - Discourse referents for individual (functions from assignments to individuals) and for worlds (functions from assignments to worlds)
  - The state of a discourse is reflected in a set of sets of assignments $DS = \{I, I', I'', \ldots\}$ (Van den Berg, 1996), where each $I = \{i_1, i_4, \ldots\}$ constitutes an option of what the discourse referents (drefs) could be mapped to.

    Singular drefs (as introduced by *a donkey*) store the same individual throughout one set of assignments I (for any singular dref u, there is an x s.t. $u(i) = x$ for all $i \in I$).

    Plural drefs (as introduced by *some donkeys*) can store different possibilities of picking a donkey across the assignments in a set of assignments I – an information state can store a non-singleton set of individuals.
  - Sentences denote relations between sets of sets of assignments:

    $\langle I, J\rangle \in [\, u, v, \ldots \mid \textit{conditions}]$ iff J is a set of assigments j which

    (i) extend some $i \in I$ by differing from i at most on the values assigned to the new referents $u, v, \ldots$, and

    (ii) assign values such that all *conditions* are true, and

    (iii) all $i \in I$ are extended by some $j \in J$ which differs at most on the values assigned to the new referents $u, v, \ldots$.
  - Japanese conditional antecedents (i.e., ϕ-COND) introduce a world dref q that w.r.t. each I stores all possibilities (maximality) of assigning a ϕ-world (i.e., a subset of the ϕ-worlds , usually plural)

    -Cond^q(*I get on a plane*) $\rightsquigarrow$ **max**^{q}(`I-get-on-a-plane`$_q$)

    q can be used as the restrictor for quantificatonal adverbials like *usually*.
  - **moshi**^{p} introduces a singular dref for worlds ('one possibility the world could be'), and **-Cond**^{q} is anaphoric to it (techncially: q stores a structured subset of values for p)

    $\Rightarrow$ any conditional antecedent prefixed by *moshi* stores a singular dref

    Singular drefs are not suitable for restricting q-adverbials including the covert generic one (e.g. De Swart (1996)) $\Rightarrow$ *moshi* results in infelicity.
  - Modals (including the covert necessity modal assumed for unmodalized epistemic conditionals) are interpreted as part of the consequent (pointwise introducing sets of epistemically accesssible worlds at the antecedent dref, which can be singular or plural) $\Rightarrow$ *moshi* is felicitous.

Finding: Optional antecedent initial markers differ across languages.

- Hindi marks conditionals with consequent initial *to* (Bhatt and Pancheva, 2006; Sharma, 2010).

  agar can be added optionally and does not block quantificational/generic readings Sharma (2010:his (1); imperfective aspect yields the 'whenever'-reading):

  (58) *agar bāriś hotī̄ hai to ˜āgan mẽ kī̄car hojātā*
  if rain-F be-IMPFV.F AUX-PRES.3SG then courtyard in mud-M
  hai.
  become-IMPFV.M.SG AUX-PRES.3SG
  'If it rains, then there is mud in the courtyard.'

  So, is *agar* truly optional -?

- Similarly, Nepali (also Indo Aryan) *yedhi* (which in Hindi exists as a more formal alternative to *agar*, Praaval Yadav, p.c.). [*more on other aspects of Nepali conditionals on Friday*]

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