

Conditionals are causal

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- ▶ The bareness of eventive verbs in English allows us to detect a three-way correlation between Aktionsart, temporal orientation, and modal flavor in conditionals (Copley, 2009a).
 - ▶ eventives \leftrightarrow future orientation \leftrightarrow metaphysical modality
 - ▶ statives \leftrightarrow present orientation \leftrightarrow epistemic modality
- ▶ This three-way correlation will suggest, given a couple of assumptions, that all conditionals express a causal relationship between events.

Aktionsart and temporal orientation

The Bare Eventive Constraint

- (1) a. Zoe dances now/tomorrow. atelic eventive: *=, > ok
b. Zoe leaves now/tomorrow. telic eventive: *=, > ok
c. Zoe is home now/tomorrow. stative: = ok, > ok

	present orientation	future orientation
eventives	bad	ok
statives	ok	ok

We'll set aside all generic/habitual readings for now.

(2) Parsons (1990)

- a. “. . . a present tense event sentence construed in the reportive sense can be true only at one specific instant—the time the event culminates. Such a sentence, then, can be used truly only in very specific circumstances.” (1990: 30)
- b. Brutus stabs Caesar = PRES($\exists t$)[$t \in \text{NOW} \ \& \ \text{Stabbing}(e) \ \& \ \text{Subject}(e, \text{Brutus}) \ \& \ \text{Object}(e, \text{Caesar}) \ \& \ \text{Cul}(e)$] (see discussion pp. 213-4)

(3) Smith (1991)

- a. “There is a pragmatic principle of interpretation for sentences about Present time, requiring that they be interpreted in a certain way: Present sentences may not include the endpoints of situations.” (1991: 110)
- b. The viewpoint Perfective is located at interval I; with the condition that the situation S obtains at I, and there are times t_i, t_n included in I at which the endpoints of S obtain. (1991: 127)

(4) Kamp & Reyle (1993)

- a. The eventuality described by a present tense sentence must properly include the utterance time n. (1993: 536)
- b. “[$(4a)$] indicates that the eventuality must have the status of a state and not of an event. . . . a sentence which describes something as going on at a time . . . cannot represent that something as an event. For the event would have to be entirely included within the location time and thus would not extend beyond it.” (1993: 536-7).

Condoravdi (2002): Temporal orientation facts under modals are the same.

- (5) a. Zoe will/should/may dance now. atelic eventive: *=, > ok
 b. Zoe will/should/may leave now. telic eventive: *=, > ok
 c. Zoe will/should/may be sick now. stative: = ok, > ok

	present orientation	future orientation
eventives	bad	ok
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I'm going to argue that there are no real future-oriented statives.

No real future-oriented statives

Eventives get into the future automatically, while statives need to be “anchored,” even under *will*:

- (6)
 - a. Zoe will dance.
 - b. Zoe will leave.
 - c. Zoe will be at home. (“... when??”)

- (7)
 - a. At 4 o'clock, Zoe will be at home.
 - b. When you next see Zoe, she will be at home.
 - c. If it's 4 o'clock, Zoe will be at home.

⇒ Eventives are automatically future-oriented with respect to their temporal argument t^* , while statives are automatically present-oriented with respect to *their* temporal argument t^* , which must be shifted forward and bound by the anchor if the stative is going to be future-oriented. *Will* permits (but does not require) this forward-shifting.

(8) Zoe will leave at 4 o'clock. $t^* = \text{now}$

(9) Zoe will be at home at 4 o'clock. $t^* = 4 \text{ o'clock}$

The same facts hold for other modal contexts, including within antecedents.

- (10)
- a. If Zoe dances in her office ... atelic eventive: *=, > ok
 - b. If Zoe leaves ... telic eventive: *=, > ok
 - c. If Zoe is home ... stative: = ok, > ok? (if not right now, "when??")
 - d. If Zoe is home at 4 o'clock ... stative: > ok with anchor

A test to see the shifting forward of t^* :

- (11) a. If it's true tomorrow that Zoe is sick ...
b. #If it's true now that Zoe is sick tomorrow ...

The temporal argument t^* = the time at which truth of *Zoe is sick* is evaluated.

So, taking into account the idea that t^* can be future-shifted, we get the following:

	present orientation	future orientation
eventives	bad	ok
statives	ok	bad

⇒ The BEC is insufficient.

Propositions and non-propositions

If the BEC isn't sufficient, what would work?

- (12) a. #It rains tomorrow.
b. If it rains tomorrow ...
c. #If it's true that it rains tomorrow ...
- (13) a. Zoe dances tomorrow.
b. If Zoe dances tomorrow ...
c. If it's true that Zoe dances tomorrow ...

Suspicion that will prove useful: Bare eventive phrases such as *It rains tomorrow* are not even propositions. They are about events happening.

Let's assume that propositions are (i) assertable and (ii) fine under *it's true that*. Thus:

- ▶ English statives are propositions.
- ▶ Bare English eventives are not propositions.

Temporal predicates (anything with tense or aspect) are also propositions:

- (14) a. Zoe left.
b. Zoe has left.
- (15) a. If it's true that Zoe left yesterday ...
b. If it's true that Zoe has left ...
- (16) Zoe dance.
'Zoe is dancing.'

What could be causing this difference?

Assumption: it's a type distinction.

But why would a type distinction matter to temporal orientation?

Modal flavor and temporal orientation

- ▶ Propositions; assertion, epistemic modality
- ▶ On the idea that statives are propositions, maybe whenever they occur there is the addition of a proposition to the common ground **at t^*** , and this is why there are no true future-oriented statives.
- ▶ In that case, we would be free to invoke a version of the BEC for the lack of present-oriented eventives.

So maybe ...

- ▶ eventives \leftrightarrow future orientation \leftrightarrow metaphysical modality
- ▶ statives \leftrightarrow present orientation \leftrightarrow epistemic modality

And perhaps metaphysical modality has something to do with the temporal orientation of eventives.

In order to tell such a story, we would expect that:

- ▶ Antecedents have their own modal flavor independent of the modal flavor of the consequent.
- ▶ Epistemic modals in English never take eventives as complements.
- ▶ Metaphysical modality does not involve propositions.

We'll verify these in turn, and reach the conclusion that

- ▶ Conditionals are causal.

Antecedents have their own modal flavor

Is it so crazy?

- (17)
 - a. If it's raining, Zoe gets sick.
 - b. If Zoe gets sick, it's raining.

- (18)
 - a. If it's raining, Zoe will get sick.
 - b. If Zoe gets sick, it will be raining.

No real epistemic eventives

Condoravdi (2002), Kaufmann (2005): “settledness”

- (19) a. It hasn't been decided yet who he will meet with.
b. He may see the dean. He may see the provost.
- (20) a. It has been decided who he will meet with but I don't know who it is.
b. He may see the dean. He may see the provost.

cf. “plannability” (Copley 2002, 2008, 2009b)

- (21) a. John sees the dean tomorrow.
b. #John gets sick tomorrow.

Another fact: t^* of consequent is event time of antecedent, so if there is an eventive consequent \Rightarrow the consequent event time begins at or after event time of antecedent.

- (22)
- a. If it's raining right now, I'll give her a call right now/later.
 - b. If it rains on Monday, I'll give her a call #right now/then.

- (23) a. If Zoe dances on Monday, I'll give her a call right now.
b. #If it rains on Monday, I'll give Zoe a call right now.
(=(22b))

The “event time” (for the purposes of relating temporal orientation) of the antecedent *on the futurate reading* is now, not Monday \Rightarrow time of state of having the plan

- (24) If it's true that Zoe dances on Monday, I'll give her a call right now.

Just like generic/habitual readings and lexical statives:

- (25) If Zoe dances, I'll give her a call right now.
- (26) a. Zoe is dancing these days.
b. Zoe is dancing on Monday.
- (27) a. Zoe lives in Paris.
b. Zoe is living in Paris.
- (28) a. Zoe dances tomorrow.
b. Zoe is dancing tomorrow.

All this means there are no real epistemic eventives. So not only is this the case:

	present orientation	future orientation
eventives	bad	ok
statives	ok	bad

But this is also the case:

- ▶ eventives \leftrightarrow future orientation \leftrightarrow metaphysical modality
- ▶ statives \leftrightarrow present orientation \leftrightarrow epistemic modality
- ▶ No future-oriented statives: assertion/epistemic modality, addition of proposition to CG only at t^* .
- ▶ No present-oriented eventives because: some version of BEC.

- (29) BEC, boring type-theoretic version:
- Assertive contexts and epistemic modals require properties of situations.
 - Eventive predicates are properties of events.
 - Therefore no eventive predicate can be asserted or be the complement of an epistemic modal.

Apparent counterexample: narrative/historical present

- (30) He shoots, he scores!

But see Moeschler's (2014) [+narrative] feature: "Narration is about events, not thoughts."

If we use the boring type-theoretic version of the BEC instead of one of the classic versions, we still need to say why eventives are future-oriented in metaphysical modal contexts.

- (31)
- | | | |
|----|---------------------------------------|-----------------------------|
| a. | Zoe leaves tomorrow. | really a stative (futate) |
| b. | My assistant (now) appears. | direct description of event |
| c. | If Zoe leaves (tomorrow) . . . | modal context |
| d. | Zoe will/should/may leave (tomorrow). | modal context |

So we need to understand what these metaphysical modal contexts are doing to future-shift the eventive. This will come out of the next thing we need to explain . . .

Metaphysical modality without propositions

We noted earlier that metaphysical modality can't involve propositions, because bare eventives are not propositions and are not present-oriented.

Hacquard (2006): accessibility relation takes an event argument

- ▶ Causal accessibility: e_2 is causally accessible from e_1 iff e_2 is in a causal chain that proceeds from e_1
- ▶ Branching comes from different choices of the initial conditions
- ▶ *ceteris paribus*: the speaker chooses initial conditions that they think are appropriate, but could be wrong
- ▶ Not the same as *because*

But don't we need to explain causation in terms of possible worlds???

That's only one of two options. Either option is legitimate (Hall (2004), Copley & Wolff (in press)):

- ▶ causation is constructed in terms of possibilities
dependency theories of causation

Lewis (1973, 2000), Dowty (1979), Mackie (1980), Suppes (1970), Eells (1991), Woodward (2003)

- ▶ possibilities are constructed in terms of causation
production theories of causation

Fair (1979), Dowe (2000), Kistler (2006), Wolff et al. (2007)

(32) $\lambda w \lambda p \in D_{\langle w,t \rangle} \lambda q \in D_{\langle w,t \rangle} \cdot$
for all w' metaphysically accessible from w such that
 $p(w')$, $q(w')$

Can we just replace worlds with events, like this?

(33) $\lambda e \cdot \lambda p \in D_{\langle v,t \rangle} \lambda q \in D_{\langle v,t \rangle} \cdot$
for all e' causally accessible from e such that $p(e')$, $q(e')$

Not exactly!

(34) $\lambda c \lambda p \in D_{\langle v, t \rangle} \lambda q \in D_{\langle v, t \rangle}$. all causally accessible courses of events from e_c that include an e' such that $p(e')$ are such that: all causally accessible courses of events from e' include an e'' such that $q(e'')$

Conditionals are causal

“Mixed” conditionals, corresponding type distinction \Rightarrow we now need to worry about the meaning of conditionals. **If** we want a unified semantics of conditionals, then either:

- ▶ Option 1: Conditionals take predicates of situations (or worlds, as in (32)). Eventives get type-shifted from predicates of events to predicates of situations (or worlds).
- ▶ Option 2: Conditionals take predicates of events, as in (34). Statives and temporal predicates get type-shifted from predicates of situations to predicates of events.

Option 1: Conditionals take predicates of situations (or worlds).
Eventives get type-shifted from predicates of events to predicates of situations (or worlds).

- ▶ Direction of derivation may be wrong: Lakoff & Johnson (1980), Traugott (1987), Sweetser (1990) a.o.
- ▶ Need some way to relate an event to a situation. Remember, events can't *be* situations if the reason why bare eventives can't be asserted is a type difference
- ▶ Even if it can be done, it destroys our explanation for why eventives are forward-shifted

Option 2: Conditionals take predicates of events. Statives and temporal predicates get type-shifted from predicates of situations to predicates of events.

$$(35) \quad \text{ADD}(e) = \\ \lambda c \lambda p \in D_{\langle s,t \rangle} . e \text{ is an event of adding } p \text{ to } CG_c$$

“As descriptions, sentences describe real-world events and the causal forces leading up to those events; as *conclusions*, they are themselves understood as being the result of the epistemic forces which cause the train of reasoning leading to a conclusion.”

(Sweetser 1990: 65)

- ▶ Approaches dynamic theories of meaning: Kamp (1981), Heim (1982), Lascarides and Asher, (1993), Smessaert & ter Meulen (2004), ...
- ▶ Is, type-wise, a kind of opposite of aspect
- ▶ Could easily be used for evidentials

If Option 2 is correct, all conditionals are causal.

(36) If a creature has a heart, it has a liver.

'all currently causally accessible courses of events that include an event *e*' of [adding the proposition *this creature has a heart* to the common ground], are such that all courses of events causally accessible from *e*' include an event of [adding the proposition *this creature has a liver* to the common ground].'

Option 2 explains the temporal facts too:

Only forward-shifted eventives: Since events are in a causal chain (of arbitrary length) from the contextually salient event at t^* , they occur after t^* .

Only present-oriented propositions: If we assume that adding a proposition to the common ground is essentially instantaneous, then although the addition is a causally subsequent event to the contextually salient event, it still gives the impression of being close to t^* ; and in any case the propositions themselves are evaluated with respect to c (i.e., where t^* comes from).

Conclusions

- ▶ Bare eventives are future-oriented and metaphysical because they describe events that are causally accessible from the present.
- ▶ Statives and temporal predicates are present-oriented and epistemic because they are propositions that are added to the common ground; they are evaluated at the present time.
- ▶ Conditionals are causal with a dynamic-style type-shifting operation (“ADD”) to turn propositions into descriptions of the event of adding the proposition to the common ground.

Bonus slide 1: Futurates

How do futurates get to be stative?

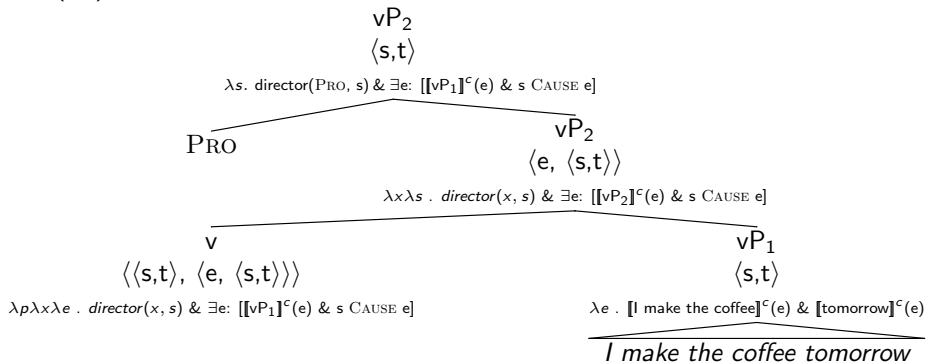
Copley (2014), Copley & Wolff (in press)

- (37) If (it's true that) Zoe dances on Monday, I'll give her a call right now.
- (38) a. #It rains tomorrow.
b. #Zoe gets sick tomorrow.
c. The sun rises at 6:15 tomorrow morning.
d. The tide comes in at 6:15 tomorrow morning.

futate syntax-semantics interface + dispositions

Bonus slide 2: Futurate syntax-semantics interface

(39)



$\lambda x \lambda s. \text{director}(x, s) \ \&$

$\exists e: [[\text{I make the coffee}]^c(e) \ \& \ [\text{tomorrow}]^c(e) \ \& \ s \ \text{CAUSE } e]$

Bonus slide 3: Dispositions

The apparent “agent requirement” with idiosyncratic inanimate exceptions in futurates is really a strict requirement for dispositions that derives from the fact of the temporal gap.

