

When (and how) to intervene

Lifetime effects and other counterfactual mysteries

Stefan Kaufmann

University of Connecticut

Conditional Constructs Across World Languages
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Outline

- 1 Overview
 - Questions
 - English conditionals
 - Lifetime effects
 - Preview
- 2 English conditionals
- 3 Models
- 4 More languages

Overview

Questions

Past/Perfect morphology often marks counterfactuality

- ▶ widespread, though not universal
- ▶ in English, it is true twice over
 - two kinds of “subjunctives”
 - both marked with Past/Perfect

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 - both marked with Past/Perfect

What does Past/Perfect do in counterfactuals?

- ▶ “fake” – expressing (irrealis) mood
- ▶ “real” – expressing (temporal) anteriority
- ▶ variation across (and even within) languages?

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Overview

English conditionals

Indicative / O-marked

- (1) If John **runs** the Boston Marathon next spring, he **will** win.

Simple Past subjunctive / SP X-marked

- (2) If John **ran** the BM next spring, he **would** win.

Past Perfect subjunctive / PP X-marked

- (3) If John **had run** the BM next spring, he **would have won**.

Overview

Lifetime effects

English Present Perfect

(4) ??Einstein has visited Princeton.

(5) Princeton has been visited by Einstein.

Overview

Lifetime effects

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- ▶ odd because Einstein is not alive
 - cf: Donka Farkas has visited Princeton.

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- ▶ fine because Princeton still exists
 - cf: ??East Germany has been visited by Putin.

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Lifetime effects

English Present Perfect

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- ▶ fine because Princeton still exists
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roughly, in these cases:

- ▶ conveys that the topicalized participant is still around

(Chomsky, 1970; Smith, 1997; Musan, 1997, 2002; Portner, 2003; Meyer-Viol and Jones, 2011, i.a.)

Overview

Preview

Lifetime effects in conditionals

- ▶ exist
- ▶ affect both well-formedness and interpretation
- ▶ in English and in other languages
- ▶ shed light on the SPX/PPX distinction:
 - PPX are restricted to a narrow range of plausible scenarios
 - SPX are the default expression for everything else

Outline

- 1 Overview
- 2 English conditionals
 - Basics
 - What X marks
- 3 Models
- 4 More languages

English conditionals

Basics

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English conditionals

What X marks

X-marking

► meaning:

- suspension of presuppositions (Stalnaker, 1975)
- widening of modal domain (von Fintel and Iatridou, 2023, i.a.)

► form:

- SPX: Past 'if Past, would'
- PPX: Past+Perfect 'if Past Perfect, would have'
- across languages:
 - SPX analogs tend to resemble O-marked forms
 - PPX analogs tend to have some marker of temporal anteriority

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SPX vs. PPX

- received wisdom: PPX for more far-fetched antecedents
 - counterfactuality defeasible in SPX, strong in PPX (Iatridou, 2000)
 - SPX antecedent's presuppositions checked at speech time
 - PPX antecedent's presuppositions checked in the past (Ippolito, 2013)

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 - PPX antecedent's presuppositions checked in the past (Ippolito, 2013)
- BUT some data challenge these ideas

English conditionals

What X marks

Dependence on context and content

[John trained for the Boston Marathon, but is unlikely to participate due to his travel schedule.]

- (6) a. If John **ran** the BM next spring, he **would** win.
b. #If John **had run** the BM next spring, he **would have** won.

English conditionals

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- (6) a. If John **ran** the BM next spring, he **would** win.
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[John was training for the Boston Marathon last summer when he unexpectedly died.]

- (7) a. #If John **ran** the BM next spring, he **would** win.
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English conditionals

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b. #If John **had run** the BM next spring, that **would have** been a miracle.

➡ same antecedent; consequent and context matter

English conditionals

What X marks

Dependence on context and content

[John was training for the Boston Marathon last summer when he suddenly fell ill. His health deteriorated gradually, as did his prognosis. Finally no hope was left, and he passed away.]

- (9)
- a. If John **ran** the BM next spring, that **would** be a miracle.
 - b. If John **had run** the BM next spring, that **would have** been a miracle.

English conditionals

What X marks

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[John was training for the Boston Marathon last summer when he suddenly fell ill. His health deteriorated gradually, as did his prognosis. Finally no hope was left, and he passed away.]

- (9)
- a. If John **ran** the BM next spring, that **would** be a miracle.
 - b. If John **had run** the BM next spring, that **would have** been a miracle.

- ▶ same conditionals, different context, (9b) much more acceptable
- ➡ there is leeway in how exactly A is to be enabled

English conditionals

What X marks

Lifetime effects

[Pheidippides (530-490 BC) ran 40km Marathon $\Rightarrow$ Athens.]

(10) If Pheidippides **ran** the BM next spring, he **would win**.

(11) #If Pheidippides **had run** the BM next spring, he **would have won**.

English conditionals

What X marks

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[Pheidippides (530-490 BC) ran 40km Marathon $\Rightarrow$ Athens.]

(10) If Pheidippides **ran** the BM next spring, he **would win**.

(11) #If Pheidippides **had run** the BM next spring, he **would have won**.

(2) #If John **ran** the BM next spring, he **would win**.

(3) If John **had run** the BM next spring, he **would have won**.

- ➡ SPX with more far-fetched / less realistic antecedents than PPX
 - ▶ (2,3): PPX used for more far-fetched antecedents than SPX.
 - ▶ (10,11): SPX used for more far-fetched antecedents than PPX.

English conditionals

What X marks

- SPX is the semantically unmarked default expression of X-marking
signals a *causal intervention* to widen the modal domain
(Kaufmann, 2005a, 2013; Schulz, 2007, 2011)
- PPX adds temporal backshift
signals that the intervention affects past events (Kaufmann, 2023)
- ▶ SPX/PPX choice depend on time of intervention
(not far-fetchedness of the like)

English conditionals

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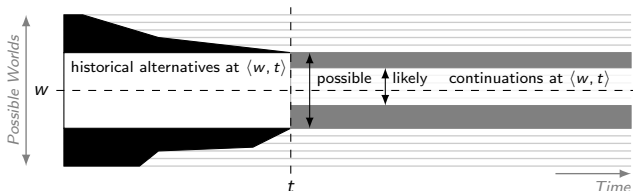
It's hard to come up with natural changes to past events that let Pheidip-
pides participate in current Boston Marathons ➡ #PPX in (11)

Outline

- 1 Overview
- 2 English conditionals
- 3 Models**
 - Time and modality
 - Causal intervention
 - Another example
 - Interim summary
- 4 More languages

Models

Time and modality



T × W-frame

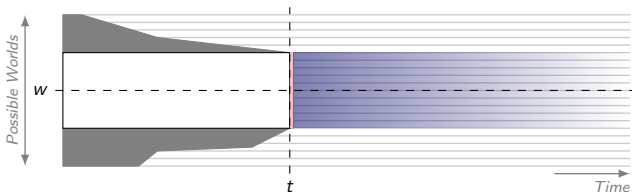
- ▶ interpretation at world-time pairs
- ▶ history proceeds by shedding alternative courses of events
- ▶ alternatives at $\langle w, t \rangle$:
 - same up to t
 - diverse after t
- ▶ similar a branching model; but here:
 - distinct histories do not overlap
 - common past at hist. alternatives: not identical, but indistinguishable

➡ one past

➡ many possible futures

Models

Time and modality



simple sentences

(12) John runs for every red $\langle w', t \rangle$,
 there is a blue $\langle w', t' \rangle \geq \langle w', t \rangle$
 at which 'John run' is true

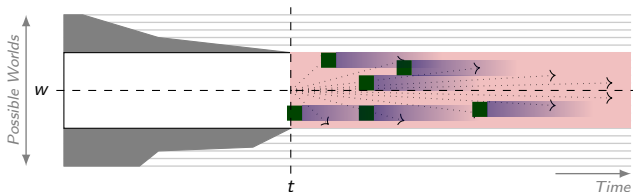
(13) John will run for most red $\langle w', t \rangle$,
 there is a blue $\langle w', t' \rangle \geq \langle w', t \rangle$
 at which 'John run' is true

► two components:

- **modal:** *all* alternatives for bare tense — *most* alternatives for 'will';
- **temporal:** *no earlier* for 'pres' — *earlier* for 'past'

Models

Time and modality



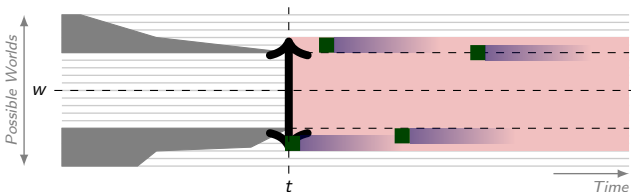
indicative conditionals

- (14) If John runs, he will win
 for most red $\langle w', t' \rangle$ at which 'John runs' is true,
 there is a blue $\langle w', t'' \rangle$ at which 'John win' is true.

- ▶ two effects on the modal component of the matrix clause.
 - forward expansion from line to area
 - restriction to those points at which the antecedent is true

Models

Time and modality



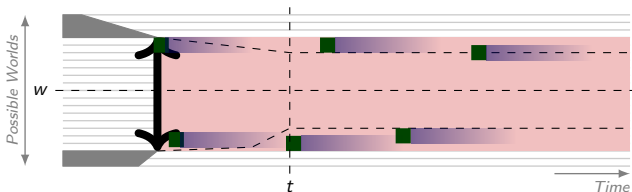
sp subjunctives

- (15) If John ran, he would win
 for most red $\langle w', t' \rangle$ at which 'John runs' is true,
 there is a blue $\langle w', t'' \rangle$ at which 'John win' is true.

- ▶ three effects on the modal component of the matrix clause
 - intervention to expand modal accessibility
 - forward expansion from line to area
 - restriction to those points at which the antecedent is true

Models

Time and modality



pp subjunctives

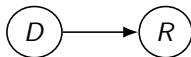
- (16) If John had run, he would have won
 for most red $\langle w', t' \rangle$ at which 'John runs' is true,
 there is a blue $\langle w', t'' \rangle$ at which 'John win' is true.

- four effects on the modal component of the matrix clause
 - backshift to an earlier intervention time
 - intervention to expand modal accessibility
 - forward expansion from line to area
 - restriction to those points at which the antecedent is true

Models

Causal intervention

a simple causal network



► variables

- D : 'whether John is dead'; R : 'whether John runs'
- assume boolean (yes/no)

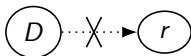
► arrows mark **causal influence** (not causation)

- whether John is dead affects whether he runs
- value of D determines likelihood of R

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► **intervention** on a variable A

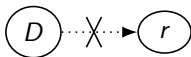
à la (Pearl, 2000, i.a.)

- remove all arrows into A
- set A to the designated value

Models

Causal intervention

a simple causal network



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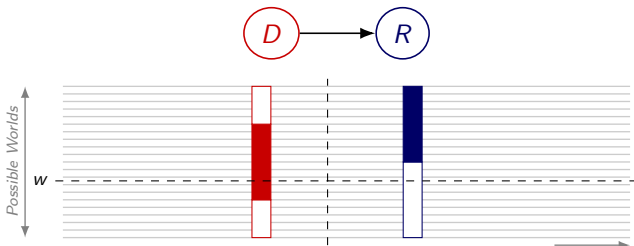
- how is this related to the $T \times W$ model?
- where does the SP/PP distinction come in?

Models

Causal intervention

a simple causal network

(Kaufmann, 2013, simplified)



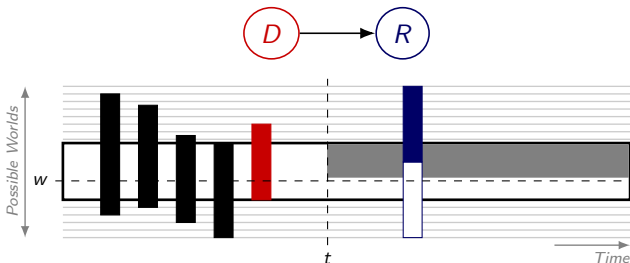
- ▶ **variables:** **causally relevant partitions**
 - ordered by causal anteriority (directed acyclic graph)
 - distinct from temporal precedence (but constrained by it)
- ▶ **partition cells:** **causally relevant propositions** ■ 'dead'; □ 'not dead'; etc.
- ▶ **cells containing w :** **causally relevant truths** at w
 - propositions are sets of world-time pairs (time-slices), not sets of worlds.
 - eventualities (states, processes, culminations, etc.) can be simulated by sequences of propositions with causal structure (not depicted)

Models

Causal intervention

causal premise semantics

(Kaufmann, 2013, simplified)



at $\langle w, t \rangle$:

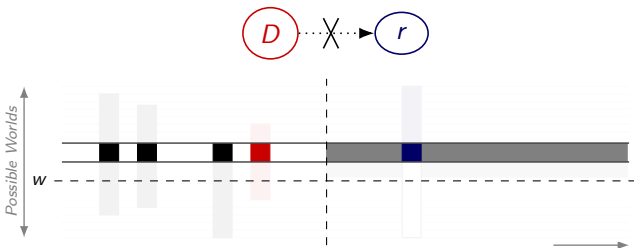
- ▶ **modal base:** causally relevant truths at w up to t
- ▶ **accessibility:** worlds at which all causally relevant truths at $\langle w, t \rangle$ are true
- ▶ **ordering source:** causal possibilities/likelihoods, given causally relevant truths

Models

Causal intervention

update the hard way

(Kaufmann, 2013, simplified)



- ▶ collect maximal sets of causally relevant truths that are closed under causal ancestors and **logically consistent** with r
- ▶ for each such set: add ordering-source propositions (causal laws) to determine what is **causally coherent**
 - (nb: modal base not empty even for subjunctives, *pace* Kratzer)
- ▶ here, the original modal base is consistent with r but adding r is causally incoherent (keeps out any ordering-source propositions)
- ➡ r is a miracle – truth of sp subjunctive predicted

Models

Causal intervention

simple update (just described) predicts sp:

(17) If John ran the BM next spring, that would be a miracle.

but how to derive pp?

(18) If John had run the BM next spring, he would have won.

Models

Causal intervention

simple update (just described) predicts sp:

(17) If John ran the BM next spring, that would be a miracle.

but how to derive pp?

(18) If John had run the BM next spring, he would have won.

➡ looking for an explanation

(19) For John to run the BM next spring, he would have to have survived last year.

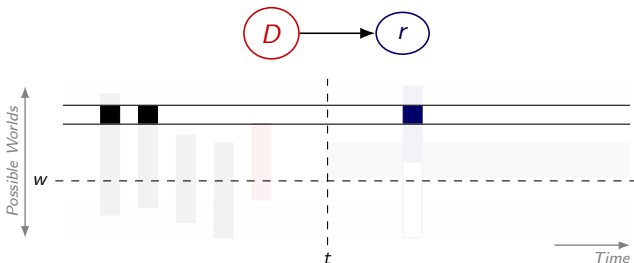
(20) If John had survived, he could have run.

Models

Causal intervention

update the soft way

(Kaufmann, 2013, simplified)



- ▶ collect maximal sets of causally relevant truths that are closed under causal ancestors and for which r is a **causally coherent** completion

(before r is added, r is a strong possibility under the causal ordering source)

Dehghani, Iliev, and Kaufmann (2012); Kaufmann (2013) for more

- ▶ salient past time (of the last modal-base propositions) motivates pp
- ▶ If John ran, he would (have to) have survived.

Models

Causal intervention

disjoint explanations

- (21) For John to run the BM next spring, he would have to
 - a. be resurrected; OR
 - b. have survived last year.
- (22) a. If John were resurrected, he could run.
b.??If John were resurrected, he could have run.
- (23) a. If John had survived, he could run.
b. If John had survived, he could have run.

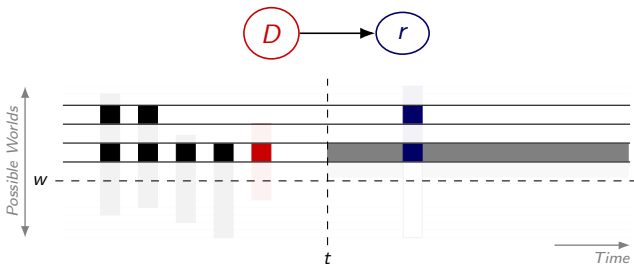
- ▶ two (disjoint) ways to enable John's running
 - resurrection possible but causally incoherent (dead, then runs)
 - survival possible and causally coherent (alive and runs)

Models

Causal intervention

update either way

(Kaufmann, 2013, simplified)



- ▶ soft update requires a causally coherent pathway to the antecedent
- ▶ hard update does not
- ▶▶ lifetime effects in PP but not in SP

Models

Another example

Iceland is a habitat of wild salmon and a producer of farmed salmon. The two salmon populations are genetically distinct and should not interbreed. A storm is approaching which will likely damage some offshore farming pods, releasing farmed salmon. If no precautions are taken, those salmon will swim up the river to the spawning grounds. Fishermen can prevent that by either installing barriers near the mouth of the river, or by emptying the pods.

Our fishermen had trouble installing the barriers yesterday; but they did. We hope the barriers can withstand the storm.

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Our fishermen had trouble installing the barriers yesterday; but they did. We hope the barriers can withstand the storm.

- (24) a. If the farmed salmon reached the breeding grounds, we would sue the supplier of the barriers.
b?? If the farmed salmon had reached the breeding grounds, we would have sued the supplier of the barriers.

Models

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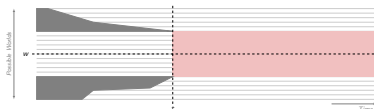
Our fishermen had trouble installing the barriers yesterday; but they did. We hope the barriers can withstand the storm.

- (24) a. If the farmed salmon reached the breeding grounds, we would sue the supplier of the barriers.
b. If the farmed salmon had reached the breeding grounds, we would have sued the supplier of the barriers.
- (25) a. If the farmed salmon reached the breeding grounds, we would empty the pods next time.
b. If the farmed salmon had reached the breeding grounds, we would have emptied the pods next time.

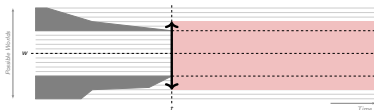
Models

Interim summary

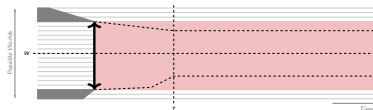
ways of supposing



forward expansion
(all conditionals)



intervention + expansion
(SP and PP)



past intervention + expansion
(PP)

Outline

- 1 Overview
- 2 English conditionals
- 3 Models
- 4 More languages**
 - German
 - English/German limitations
 - Japanese

More languages

German

John next year

(26) ??Wenn John nächstes Jahr **liefe**, **gewönne** er.

if John next year run-SUBJ win-SUBJ he

??Wenn John nächstes Jahr **laufen würde**, **würde** er **gewinnen**

if John next year run would would he win

'If John ran next year, he would win.'

(27) Wenn John nächstes Jahr **gelaufen wäre**, **hätte** er **gewonnen**.

if John next year run would have had he won

'If John had run next year, he would have won.'

- ▶ SP marked by subjunctive (*Konjunktiv II*)
two SP variants; stylistically different
- ▶ PP marked by Konjunktiv II + Perfect
- ▶ judgments parallel to English: PP preferred over SP

More languages

German

Pheidippides next year

(28) Wenn Pheidippides nächstes Jahr **liefe**, **gewönne** er.
if Pheidippides next year run-SUBJ win-SUBJ he

Wenn Pheidippides nächstes Jahr **laufen würde**, **würde** er **gewinnen**
if Pheidippides next year run would would he win
'If Pheidippides ran next year, he would win.'

(29) ??Wenn Pheidippides nächstes Jahr **gelaufen wäre**, **hätte** er **gewonnen**.
if Pheidippides next year run would have had he won
'If Pheidippides had run next year, he would have won.'

- ▶ John: PP preferred over SP
- ▶ Pheidippides: SP preferred over PP
- ▶▶ similar to English

More languages

English/German limitations

subjunctives about the past

- ▶ no simple Past antecedents

(30) #If John **ran** the Boston Marathon last year, ...

- ▶ SP and PP coincide (Ippolito, 2008)

(31) If John **had run** the BM last year, he **would have won**.

- a. If 'he ran' were true, 'he won' would be true [SP]
- b. 'if he ran, he would win' was true [PP]

- ▶ English SP/PP contrasts only observed with future reference
- ▶ similarly in German
- ▶ but not so in (some) other languages

More languages

Japanese

John next year

[John died recently.]

(32)??[John-ga rainen BM-ni **dereba** **kat-u**] daroo.
 John-NOM next year BM-LOC participate-COND win-NonPAST MODAL

a. 'If John runs the BM next year, he will win.' [O]

b. 'If John ran the BM next year, he would win.' [SP]

(33) [John-ga rainen BM-ni **dereba** **kat-]-ta** daroo.
 John-NOM next year BM-LOC participate-COND win PAST MODAL

'If John had run the BM next year, he would have won.' [PP]

▶ O-marking and SP form coincide

▶ PP marked with *-ta* PAST.

(Mizuno and Kaufmann, 2018)

▶ PP preferred, similar to English

More languages

Japanese

Pheidippides next year

[Pheidippides died long ago.]

(34) [Pheidippides-ga rainen BM-ni **dereba** **kat-u**] daroo.
P-NOM next year BM-LOC participate-COND win-NONPAST MODAL

a. 'If Pheidippides runs the BM next year, he will win.' [O]

b. 'If Pheidippides ran the BM next year, he would win.' [SP]

(35)??[Pheidippides-ga rainen BM-ni **dereba** **kat-]-ta** daroo.
Pheidippides-NOM next year BM-LOC participate-COND win PAST MODAL

'If Pheidippides had run the BM next year, he would have won.' [PP]

- ▶ John: PP preferred
- ▶ Pheidippides: SP preferred
- ▶ similar to English and German

More languages

Japanese

John last year

[John died recently.]

(36)??[John-ga kyonen BM-ni **de-tei-reba** **kat-ta**] daroo.

John-NOM last year BM-LOC participate-PERF-COND win-PAST MODAL

a. 'If John ran the BM last year, he won.'

[SP]

b. 'If John had run the BM last year, he would have won.'

[SP]

(37) [John-ga kyonen BM-ni **de-reba** **kat-]-ta** daroo.

P-NOM last year BM-LOC participate-COND win PAST MODAL

'If John had run the BM last year, he would have won.'

[PP]

- ▶ SP/PP not distinct even with past reference (unlike English and German)
- ▶ John: PP preferred

More languages

Japanese

Pheidippides last year

[Pheidippides died long ago.]

- (38) [Pheidippides-ga kyonen BM-ni **de-tei-reba** **kat-ta**] daroo.
 P-NOM last year BM-LOC participate-PERF-COND win-PAST MODAL
 'If P had run the BM last year, he would have won.' [SP]
- (39) ??[Pheidippides-ga kyonen BM-ni **de-reba** **kat-]-ta** daroo.
 P-NOM last year BM-LOC participate-COND win PAST MODAL
 'If P had run the BM last year, he would have won.' [PP]

- ▶ SP/PP do distinct even with past reference (unlike English and German)
- ▶ John: PP preferred
- ▶ Pheidippides: SP preferred
- ▶ similar to future reference in English, German, Japanese

More languages

Japanese

John 490BC

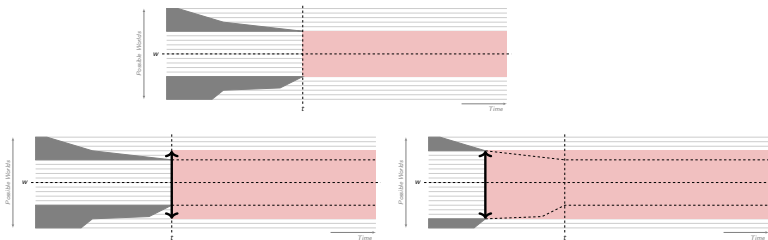
[Pheidippides died after running from Marathon to Athens in $\approx$ 490BC.]

- (40) [John-ga ano jidai hashit-tei-reba tochau-de taore-ta] daroo.
 John-NOM that time run-PERF-COND on the way dropped-PAST MODAL
 'If John had run back then, he would have dropped along the way.' [SP]
- (41) ??[John-ga ano jidai hashi-reba tochau-de taore-]-ta daroo.
 John-NOM that time run-COND on the way PAST MODAL
 'If John had run back then, he would have dropped along the way.' [PP]

- ▶ SP/PP do distinct even with past reference (unlike English and German)
- ▶ John last year: PP preferred
- ▶ John 490BC: SP preferred
- ▶ similar to Pheidippides last year

Conclusions

ways of supposing



- ▶ three modes of hypothetical reasoning (not just for conditionals)
- ▶ probably distinguished, in some way or other, in many languages
- ▶ to do:
 - inventories of expressions used to mark the distinctions
 - implicational relations
 - lots of cross-linguistic comparison

Thanks

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