

Now there will be trouble.  
Two puzzles of tense-modal forcing

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# { Introduction }

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## A little puzzle

September 7, 2013 (time **m**): Tokyo has just been elected host city of the 2020 Olympic Games. At **m** we can truthfully say:

(1) Now Tokyo will be hosting the 2020 Olympic Games.

By uttering (1) at **m**, we convey the implicature that (1') is untrue at some previous time **m**<sub>0</sub>:

(1') Tokyo will be hosting the 2020 Olympic Games.

However, (1) entails (1'), so that (1') is also true at **m**.

But, by standard assumptions in tense logic, if (1') is true at **m** then it is true at any previous time, including **m**<sub>0</sub>.

! Sentence (1') is both untrue *and* true at **m**<sub>0</sub>.

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# A natural solution to the little puzzle

(1) Now Tokyo will be hosting the 2020 Olympic Games.

Sentence (1), as ordinarily understood, receives a modal, **plan-sensitive** reading.

In this reading, the truth of (1) requires that it is **now planned** that Tokyo will be hosting the 2020 Olympic Games.

Viz., by uttering (1) we convey roughly the same content as:

(1'') Now there is a plan under which Tokyo will be hosting the 2020 Olympic Games.

☞ If so, (1)'s implicature is just that at a previous time  $m_0$  there was no such plan, which is unproblematically true.

The little puzzle is dissolved as resting on equivocation.

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# Aims of the talk

1. Generalise over (1), viz., argue that plan-sensitive readings are instances of a more general kind of readings, which we call **forcing readings**
2. Outline an account of forcing readings
3. Generalise over the little puzzle, viz., argue that, if plan-sensitive readings are recognised to be forcing readings, then the above solution to the little puzzle extends to other, prima facie less tractable philosophical puzzles

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# Now-initial sentences

- (2) Now John and Mary are getting married in April. [After a change of plan]
- (3) Now Blake will win. [Just after Bolt is disqualified]
- (4) Now you committed a crime last year. [After the new ex post facto law.]
- (5) Now Holmes didn't die in the Reichenbach falls. [After Holmes 'resuscitated' in *The adventure of the empty house*]
- (6) Now Pluto is not a planet anymore. [After IAA so resolved]
- (7) Now it was an asteroid and not climate change that killed dinosaurs. [After the relevant theory-change has occurred.]

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# Forcing readings

In spite of their superficial differences, sentences of form  
「Now  $P$ 」 like (1)–(7) have three things in common:

- (i) The truth of 「Now  $P$ 」 requires that a *forcing relation*  $R$  holds between the local condition  $c_P$  expressed by sentence  $P$  and an eventuality  $s$ .
- (ii) The eventuality  $s$  obtains at reference (usually, utterance) time and is made relevant by the occurrence of “now”.
- (iii) 「Now  $P$ 」 implicates (or presupposes) that things were different in the past as to whether  $R$  held between  $c_P$  and a then-present eventuality.

When a sentence is understood (mutatis mutandis) in accordance with (i)–(iii), we say that it receives a *forcing reading*.

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## Forcing readings, example

(2) Now John and Mary are getting married in April.

- ☞  $c_P$  = the condition that John and Mary get married in April;
  - ☞  $s$  = the existence of a wedding plan for John and Mary;
  - ☞  $R$  = the particular kind of forcing that obtains between a plan and its realization.
- (i) The truth of (2) requires that  $sRc_P$ .
- (ii)  $s$  is supposed to obtain at utterance time.
- (iii) (2) suggests that, at some previous time, no eventuality  $s'$  obtained, such that  $s'Rc_P$ .

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# Forcing readings, another example

(3) Now Blake will win.

☞  $c_P$  = the condition that Blake wins (at a future time);

☞  $s$  = the eventuality that Bolt is out of the race;

☞  $R$  = causal-historical forcing.

(i) The truth of (3) requires that  $sRc_P$ .

(ii)  $s$  is supposed to obtain at the utterance time.

(iii) a use of (3) suggests that, at some previous time, no eventuality  $s'$  obtained, such that  $s'Rc_P$ .

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# “That”-clause arguments

☞ The eventuality *s* can sometimes be brought to the fore syntactically, by a “that”-clause argument of *now*:

(3') Now **that Bolt is out**, Blake will win.

(See Carter and Altshuler 2017)

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# An objection

You are wrong. “Now Blake will win” just says that Blake will win in the future surroundings of the utterance time. There is nothing special to now-initial statements.

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# Reply

(8) ?? Tomorrow Blake will win (right) now.

(9) OK Now Blake will win tomorrow.

(10) A: Blake will win (right) now.


B: OK No, that's false. He'll run **tomorrow afternoon**.

?? No, that's false. Walter Dix could make it as well.

(11) A: Now Blake will win. [Just after Bolt is disqualified]

B: ?? No, that's false. He'll run tomorrow afternoon.

OK No, that's false. Walter Dix **could** make it as well.

 The **possibility** that Blake will not win suffices to support the **falsity** of (11A) (but definitely not the falsity of (10A)).

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# Disclaimers

Our point that now-initial sentences tend to trigger a forcing reading. This is **not** to say:

- ☞ that **only** now-initial sentences trigger a forcing reading.
- ☞ that now-initial sentences **always** trigger a forcing reading.

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# Forcing relations

Forcing relations come in different varieties. The main difference between (1)-(7) lies precisely in the identity of the relevant forcing relation.

- ☞ **Causal** forcing (“Now Blake will win”).
- ☞ **Plan** forcing (“Now Tokyo will be hosting the 2020 Olympic Games”)
- ☞ **Institutional** forcing (“Now you committed a crime last year”)
- ☞ etc.

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# Forcing relations

The relation of forcing is naturally modelled in a framework in which the modal properties of states can vary across times, as in Prior-Thomason “branching” treatment of historical modalities. E.g.:

- ➡ The local condition involved in (2), that of John and Mary’s getting married in April, is forced in that it obtains in all possible futures in which the wedding plan is realized;
- ➡ The local condition involved in (3), viz., Blake’s winning, is causally forced in that it obtains in all possible causal futures of the present eventuality (Bold’s being out).

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# The fatalistic puzzle (Aristotle, De interpretatione 19a23–25)

Assume that (A) is contingent:

(A) There will be a sea battle tomorrow.

Suppose that (A) is true. If so, then (A) is true *now*, that is:

(NowA) Now it is true that there will be a sea battle tomorrow.

But if so, then the battle is inevitable. (It is always too late to change the present.) Therefore,

(C) It is not contingent that (A).

We get the same conclusion if we assume that (A) is false.

By bivalence, nothing is contingent: fatalism is true.

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# A natural solution to the fatalistic puzzle

➡ As (A) and (NowA) are naturally understood, the step  
(A)  $\vDash$  (NowA) is invalid (see Tooley 97)

(A) There will be a sea battle tomorrow.

(NowA) Now it is true that there will be a sea battle tomorrow.

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# The changing past puzzle (Barlassina & Del Prete 2015)



It is the 23rd of July 2000. Being the rider with the lowest overall time at the end of the last stage, Lance Armstrong is declared the winner of the Tour de France by Union du Cyclisme Internationale (UCI).

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# The changing past puzzle (Barlassina & Del Prete 2015)



October 22, 2012 (time **m**): Armstrong is stripped of the 2000 Tour de France title.

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# The changing past puzzle (Barlassina & Del Prete 2015)

At **m** (October 22, 2012) we can truthfully say:

(12) Now Armstrong has no longer won the 2000 TdF title.

By uttering (12) at **m**, we presuppose that (12') is untrue at some previous time **m**<sub>0</sub>:

(12') Armstrong has not won the 2000 TdF title.

However, (12) entails (12'), so that (12') is also true at **m**.

But, by standard assumptions in tense logic, if (12') is untrue at **m**<sub>0</sub> then it is untrue at any subsequent time, including **m**.

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# A natural solution to the changing past puzzle

(12) Now Armstrong has no longer won the 2000 TdF title.

Sentence (12), as ordinarily understood, receives an (institutional) forcing reading.

In this reading, the truth of (12) requires that **there is an institutional situation** forcing the condition that Armstrong is not the winner of the 2000 TdF.

If this is right, the puzzle of the changing past is dissolved along the same lines as the initial little puzzle.

All that (12) presupposes is that, at some past time, no such institutional situation existed, which is unproblematic.

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# Concluding remarks

- A general notion of forcing enables a uniform account of a variety of cases, including plan-sensitive readings and institutionally-determined changes of the past.
- Our forcing-based account of now-initial sentences paves the way to a principled solution to a few philosophical puzzles involving time and necessity.
- 👉 Open issue: what is the best formal semantic account of “now” that allows for an explanation of its role in now-initial sentences?

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Thanks

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# References

Sam Carter & Daniel Altshuler. 2017. 'Now' as a dyadic connective. *SALT* 27.

Michael Tooley. 1997. *Time, Tense, and Causation*. Oxford: Clarendon.

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