

# Disambiguating two conditional construals

Evidence from the optionality of *if*

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Sinn und Bedeutung 25

# Overview

- The restrictor analysis treats conditionals as quantificational constructions;
- but not all conditionals contain modal operators;
- Kratzer (1986, 1991) assumes a covert epistemic necessity modal  $\Box^{epi}$ .

- (1) a. If the shelves are empty, bread flour is out of stock again.  
 b.  $\approx$  If the shelves are empty, bread flour **must** be out of stock again.
- (2)  $\Box^{epi}$   $\underbrace{[\text{the shelves are empty}]}_{\text{restrictor}}$   $\underbrace{[\text{bread flour is out of stock again}]}_{\text{nuclear scope}}$

Today's question:

To what extent do we need the covert  $\Box^{epi}$  in a theory of conditionals?

Two options, *prima facie*:

- ① Covert  $\Box^{epi}$  is available **only when there is no overt modal**;
- ② Covert  $\Box^{epi}$  is available when there is no overt modal, and **possibly when overt modals are present, too**.

Existing answer: Option 1 is dismissed with evidence from conditionals with overt **prioritizing modals** (e.g. deontic, anankastic) in **English**.

'...there are in fact no truly deontically modalized *if*-conditionals...

The deontic modal [in conditionals] is then to be analyzed within the scope of the 'higher' epistemic modal operator.' Frank (1996)

See also von Stechow and Iatridou (2005), Kaufmann and Schwager (2009), Condoravdi and Lauer (2016) a.o.

Today's goal: deontic conditionals, Mandarin

In some forms of deontic conditionals,  $\Box^{epi}$  is available; in others,  $\Box^{epi}$  is not allowed. But the disambiguation cannot be seen with English-only data.

# Roadmap

Issue:

- Deontic conditionals in the restrictor analysis

Data:

- Two types of deontic conditionals in Mandarin

Analysis:

- An  $\Box^{epi}$  that surfaces in *if*-clauses overtly
- Predictions for non-deontic conditionals

# Issue

## Basic assumptions

### Modality:

- **Modal base**  $f$ : maps a world  $w$  to a set of inviolable propositions holding at  $w$  (knowledge, facts)
- **Ordering source**  $g$ : maps a world  $w$  to a set of violable and possibly inconsistent propositions (rules, desires etc.).
- Modal operators are evaluated against a set of **minimal worlds** (assuming the Limit Assumption):

Kaufmann and Kaufmann (2015)

$$(3) \quad O(f, g, w) := \{u \in \cap f(w) \mid \forall v \in \cap f(w) [v \leq_{g(w)} u \rightarrow u \leq_{g(w)} v]\}$$

- (4) a. '*must p*' is true at  $w$  w.r.t.  $f$  and  $g$  iff for all  $v \in O(f, g, w)$ ,  $p$  is true at  $v$ .
- b. '*may p*' is true at  $w$  w.r.t.  $f$  and  $g$  iff for some  $v \in O(f, g, w)$ ,  $p$  is true at  $v$ .

## Conditionals:

- (5) 'if  $p$ , MOD  $q$ ' is true at  $w$  w.r.t.  $f$ ,  $g$  iff  
 'MOD  $q$ ' is true at  $w$  w.r.t.  $f^+$ ,  $g$ , where  $f^+ = \lambda u.f(u) \cup \{\{p\}\}$

## Conversational backgrounds:

- Deontic modal: **circumstantial modal base** (viz. the relevant facts), deontic ordering source
- Epistemic modal: epistemic modal base, **stereotypical ordering source** (viz. the normal courses of events)

See Frank (1996), Kaufmann and Schwager (2009), Condoravdi and Lauer (2016) for some other options

## Two conditional construals

For deontic conditionals, the assumption of covert  $\Box^{epi}$  gives us (at least) two analyses:

(6) If Max buys a car, he will **have to** pay car taxes.

Kaufmann and Kaufmann (2015): 260 (31), modified from Frank (1996)

### Overt Conditional Operator construal (OCO):

the *if*-clause restricts the overt deontic modal.

$\Box^{deo}$  [if Max buys a car] [he pays car taxes]

### Covert Conditional Operator construal (CCO):

the *if*-clause restricts covert  $\Box^{epi}$ ;  $\Box^{deo}$  is part of the consequent.

$\Box^{epi}$  [if Max buys a car] [ $\Box^{deo}$  he pays car taxes]

Terminology from Kaufmann and Schwager (2009)

To tease apart OCO and CCO, we need to distinguish between two readings of deontic conditionals.



## Non-shifty reading

A deontic conditional 'if  $p$ ,  $\Box^{deo} q$ ' has a **non-shifty** reading when  $\Box^{deo}$  is evaluated w.r.t. the regulations holding at **the world of evaluation**.

(6) If Max buys a car, he will **have to** pay car taxes.

Intuition:

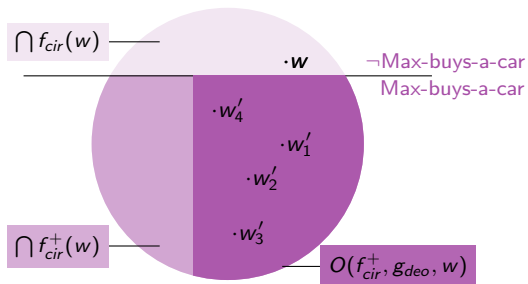
- true just in case the regulations at the evaluation world  $w$  require car-owners to pay car taxes;
- the regulations at the worlds where Max buys a car are irrelevant.

(modulo the less natural reading that Max's purchase of cars bring changes to laws of car taxes)

Both OCO and CCO-construals can derive this intuition correctly.

## OCO predicts the non-shifty reading

$\Box^{deo}$  [if Max buys a car] [he pays car taxes] is true iff  
for all  $w' \in O(f_{cir}, g_{deo}, w)$  where Max buys a car, he pays car taxes at  $w'$ .



Under OCO,  $\Box^{deo}$  gets evaluated **at the actual world of evaluation**, giving rise to the non-shifty reading.

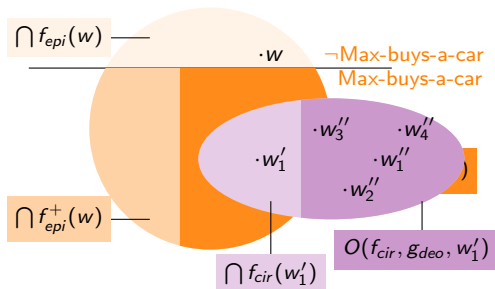
Suppose at  $w$ : Max is 50, car-owners under 70 must pay taxes.

- Collect  $f_{cir}(w)$ ;
  - Max is 50 y.o., etc.
- Add **Max buys a car** and get  $f_{cir}^+(w)$ ;
- Single out  $O(f_{cir}^+, g_{deo}, w)$ ;
  - Car owners under 70 pay car taxes,
- At each world there, check if Max pays taxes.

Prediction: True ✓

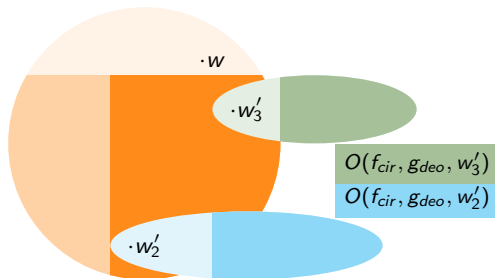
## CCO predicts the non-shifty reading

$\Box^{epi}$  [if Max buys a car] [ $\Box^{deo}$  he pays car taxes] is true iff  
for all  $w' \in O(f_{epi}, g_{st}, w)$  where Max buys a car, for all  $w'' \in O(f_{cir}, g_{deo}, w')$ , he pays  
car taxes at  $w''$ .



Suppose at  $w$ : Max is 50, car-owners under 70 must pay taxes.

- Collect  $f_{epi}(w)$ 
  - Max is 50 y.o., etc.
- Add Max buys a car, get  $f_{epi}^+(w)$
- Single out  $O(f_{epi}^+, g_{st}, w)$ 
  - Tax laws don't change, etc.
- Zoom in on  $w'_1$  there:
  - Collect  $f_{cir}(w'_1)$ 
    - Max has a car,
    - Max is 50 y.o., etc.
  - Single out  $O(f_{cir}, g_{deo}, w'_1)$ 
    - Owners under 70 pay tax;
  - At each world there, check if Max pays taxes.



- Under CCO,  $\square^{deo}$  gets evaluated **pointwise at each antecedent world**;
- When the *if*-clause doesn't describe changes of the relevant laws,  $g_{st}$  of  $\square^{epi}$  and  $f_{cir}$  of  $\square^{deo}$  ensures that **the actual laws get passed on to each antecedent world**, giving rise to the non-shifty reading.

Suppose at  $w$ : Max is 50, car-owners under 70 must pay taxes.

- Collect  $f_{epi}(w)$ 
  - Max is 50 y.o., etc.
- Add Max buys a car, get  $f_{epi}^+(w)$
- Single out  $O(f_{epi}^+, g_{st}, w)$ 
  - Tax laws don't change, etc.
- Zoom in on  $w'_1$  there...
- Zoom in on  $w'_2$  there:
  - ...
  - At each world **there**, check if Max pays taxes.
- Zoom in on  $w'_3$  there:
  - ...
  - At each world **there**, check if Max pays taxes.
- Zoom in on...

Prediction: True ✓

## Shifty reading

A deontic conditional '*if p,  $\Box^{deo} q$* ' has a **shifty** reading when  $\Box^{deo}$  is evaluated w.r.t. the regulations holding at **the antecedent worlds**.

(7) If jaywalking is illegal in this town, that guy over there **has to** be punished.  
von Stechow and Iatridou (2005): 9 (17)

Intuition:

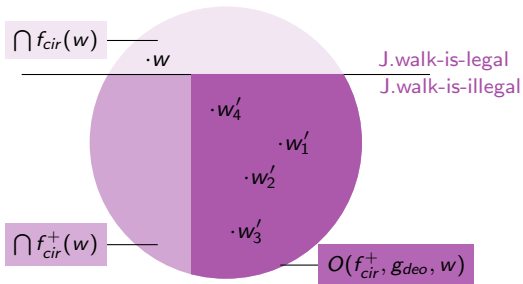
- true just in case the guy just jaywalked,
- the current regulations at the actual worlds are irrelevant to the interpretation of (7).

(modulo the less natural reading that the current laws enforce punishment on the guy in case the traffic law changes)

Only the CCO-construal can derive the shifty reading.

# OCO doesn't predict the shifty reading

$\Box^{deo}$  [if j-walk is illegal] [he gets punished] is true iff  
for all  $w' \in O(f_{cir}, g_{deo}, w)$  where j-walking is illegal, he gets punished at  $w'$ .



Under OCO,  $\Box^{deo}$  gets evaluated **at the world of evaluation**, thus failing to capture the shifty reading.

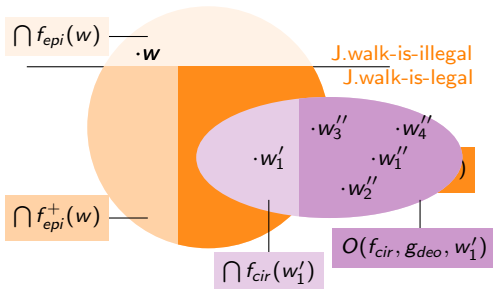
Suppose at  $w$ : j.walk is legal; He jaywalked.

- Collect  $f_{cir}(w)$  ;  
- He jaywalked, etc.
- Add *jw is illegal* and get  $f_{cir}^+(w)$  ;
- Single out  $O(f_{cir}^+, g_{deo}, w)$  ;  
- J.walkers don't get punished, etc.
- At each world there, check if he gets punished.

Prediction: False ×

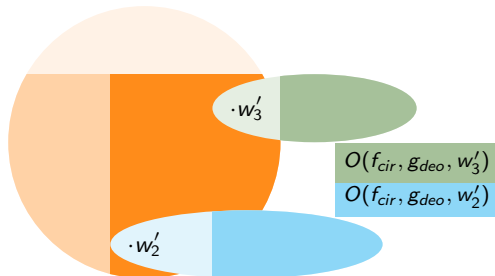
# CCO predicts the shifty reading

$\Box^{epi}$  [if j-walk is illegal] [ $\Box^{deo}$  he gets punished] is true iff  
for all  $w' \in O(f_{epi}, g_{st}, w)$  where j-walk is illegal, for all  $w'' \in O(f_{cir}, g_{deo}, w')$ ,  
he gets punished at  $w''$ .



Suppose at  $w$ : j.walk is legal; He jaywalked.

- Collect  $f_{epi}(w)$  ;  
- He jaywalked, etc.
- Add  $jw$  is illegal, get  $f_{epi}^+(w)$  ;
- Single out  $O(f_{epi}^+, g_{st}, w)$  ;  
- He's subject to local laws.
- Zoom in on  $w'_1$  there:
  - Collect  $f_{cir}(w'_1)$  ;  
- He jaywalked, etc
  - Single out  $O(f_{cir}, g_{deo}, w'_1)$   
- J.walkers get punished.
  - At each world there, check if he gets punished.



- Under CCO,  $\square^{deo}$  gets evaluated **pointwise at each antecedent world**;
- When the *if*-clause has content that can feed into the ordering source of  $\square^{deo}$ ,  $\square^{deo}$  gets **evaluated w.r.t. the hypothetical laws**, giving rise to the shifty reading.

Suppose at  $w$ : j.walk is legal; He jaywalked.

- Collect  $f_{epi}(w)$ ;
  - He jaywalked, etc.
- Add **jw is illegal**, get  $f_{epi}^+(w)$ ;
- Single out  $O(f_{epi}^+, g_{st}, w)$ ;
  - He's subject to local laws.
- Zoom in on  $w'_1$  there.
- Zoom in on  $w'_2$  there:
  - ...
  - At each world **there**, check if he gets punished.
- Zoom in on  $w'_3$  there:
  - ...
  - At each world **there**, check if he gets punished.
- Zoom in on...

Prediction: True ✓



## Interim summary

Intended reading	predicted by OCO?	predicted by CCO?
Non-shifty, e.g. ' <i>if Max buys a car</i> '	✓	✓
Shifty, e.g. ' <i>if j.walk is illegal</i> '	×	✓

- English deontic conditionals have two distinct readings— non-shifty and shifty;
- OCO captures the non-shifty reading only; CCO captures both.

Hence, Frank's conclusion: all deontic conditionals are CCO-construed.

In the rest, I will show: some deontic conditionals are CCO-construed, some are OCO-construed.

# Data

## Mandarin conditionals

- Unlike English, *if*-clause don't need to be marked in Mandarin;
- *jiu* in the matrix clause ensures the sentence's status as conditionals, rather than two propositions that the speaker commits to. See Liu (2017) for an analysis of *jiu*.

(8) *ta lai, wo jiu zou.*  
 s/he come I JIU leave  
 'If s/he comes, I'll leave.'

- *If*-clauses can also co-occur with a clause-initial marker *ruguo* (glossed as 'if');

(9) *ruguo ta lai, wo jiu zou.* ≈ (8)  
 IF s/he come I JIU leave  
 'If s/he comes, I'll leave.'

- *ruguo* doesn't add additional meaning to (9);
- But in deontic conditionals, the occurrence of *ruguo* makes a difference.

contra e.g. Cheung (2016): 266

## Deontic conditionals

- Deontic necessity modal *bixu* 'must' in the consequent.
- **ruguo is optional for the non-shifty reading.**

- (10) There're lots of things for Ming to do when he moves to the US...
- a. ✓ **ruguo** *zai meiguo mai che, jiu bixu shang baoxian.*  
 IF at US buy car JIU must get insurance
- b. ✓ *zai meiguo mai che, jiu bixu shang baoxian.*  
 at US buy car JIU must get insurance  
 'If he buys a car in the US, he must get car insurance.'

- **ruguo is obligatory for the shifty reading.**

- (11) I'm new to this town and haven't learned about the traffic rules, but...
- a. ✓ **ruguo** *zai zheli hengchuanmalu weifa, ta jiu bixu jiao fajin le.*  
 IF at here jaywalk illegal he JIU must pay fine PERF
- b. ?? *zai zheli hengchuanmalu weifa, ta jiu bixu jiao fajin le.*  
 at here jaywalk illegal he JIU must pay fine PERF  
 'If jaywalking is illegal here, he has to pay fines.'

# Generalization

The contrast between *ruguo*-less and *ruguo* deontic conditionals reflects just the contrast between the readings yielded by OCO and CCO.

Intended reading	Theoretical prediction		Speakers' intuition	
	OCO	CCO	<i>ruguo</i> -less	with <i>ruguo</i>
Non-shifty	can derive	can derive	✓	✓
Shifty	can't derive	can derive	??	✓

*ruguo*-less deontic conditionals are OCO-construed;

- CCO would wrongly predict them to have the shifty reading.
- We don't see such deontic conditionals in English.

With *ruguo*, deontic conditionals get CCO-construed.

# Analysis

# *ruguo* is an epistemic necessity modal

## *ruguo* is an epistemic necessity modal:

$$(12) \quad \llbracket \textit{ruguo} \rrbracket = \lambda f. \lambda g. \lambda p. \lambda w. \forall v \in O(f, g, w) [v \in p]$$

- must occur with an overt restrictor before combining with the consequent;
- Hence, deontic conditionals with *ruguo* instantiate the CCO, with  $\Box^{epi}$  surfacing as *ruguo* overtly.
- With *ruguo*, we derive the non-shifty and the shifty reading depending on whether the antecedent feeds into the content of  $\Box^{deo}$ .

(13) Non-shifty:  $\text{RUGUO}_{f_{epi}}^{g_{st}}$  [Ming buys a car]  $\text{BIXU}_{f_{cir}}^{g_{deo}}$  [he gets car insurance]

(14) Shifty:  $\text{RUGUO}_{f_{epi}}^{g_{st}}$  [j-walking is illegal]  $\text{BIXU}_{f_{cir}}^{g_{deo}}$  [he pays fines]

**Prediction: with *ruguo*, quantificational elements in the consequent can't be restricted by if-clauses.**

## Prediction #1: Generic conditionals

- In generic conditionals, a covert **GEN-operator** gets restricted by the antecedents (in English, *if*-clauses or *when*-clauses). Farkas and Sugioka (1983)
- Prediction: *ruguo* is **not allowed** in generic conditionals.
- Result: **borne out**, e.g. description of natural laws in (15).

(15) In a geography class, the teacher says...

a. ??*ruguo haibai shangsheng 100 mi, wendu jiu xiajiang 0.6 du.*  
RUGUO altitude increase 100 meter temp. JIU drop 0.6 degree

b. ✓ *haibai shangsheng 100 mi, wendu jiu xiajiang 0.6 du.*  
altitude increase 100 meter temperature JIU drop 0.6 degree  
 'When/If the altitude increases by 100 meters, the temperature decreases by 0.6 degree.'

See Appendix I for an epistemic reading of (15) and the behavior of *ruguo* there.



# Prediction #2: Adverbs of quantification

- *If*-clauses can restrict **adverbs of quantification** Lewis (1975), Geurts (2004) among others

- (16) a. **Always/Usually/Sometimes/...**, if it rains, my roof leaks.  
 b. For all/most/some/... instances of raining, my roof leaks.

- Prediction: ***ruguo*-antecedents can't restrict** adverbs of quantification.
- Result: **borne out**, e.g. *jingchang* 'often' in (17).

(17) a. ??*jiu fangzi*, **jingchang** **ruguo** *xiayu*, *jiu lou shui*.  
           old house    often            RUGUO rain    JIU leak water

      b. ✓ *jiu fangzi*, **jingchang** *xiayu*, *jiu lou shui*.  
           old house    often            rain    JIU leak water  
           'Often, if it rains, it leaks in an old house.'

See Appendix II for an epistemic reading of (17) and the behavior of *ruguo* there.

## Prediction #3: Nominal quantifiers

- *If*-clauses can restrict **nominal quantifiers in the matrix clause**.

von Fintel and Iatridou (2002), Geurts (2004)

- (18) a. **Most letters** are answered if they are shorter than 5 pages.  
 b.  $\approx$  Most letters that are shorter than 5 pages are answered.

von Fintel and Iatridou (2002): 2-3 (5),(7) credited to Angelika Kratzer and Irene Heim

- Prediction: ***ruguo*-antecedents can't restrict** matrix nominal quantifiers.
- Result: **borne out**, e.g. with *xuduoren* 'many people' in (19):

- (19) a. ??***ruguo*** *chachu le zhifanggan, xuduoren jiu gaibian le yinshi*  
 RUGUO diagnose PERF hyperlipidemia many.pll JIU change PERF diet  
*xiguan.*  
 habit
- b. ✓ *chachu le zhifanggan, xuduoren jiu gaibian le yinshi xiguan.*  
 diagnose PERF hyperlipidemia many.pll JIU change PERF diet habit  
 'Many people changed their diet if they were diagnosed with hyperlipidemia.'

See Appendix III for an epistemic reading of (19) and the behavior of *ruguo* there.

## Conclusion

## Conclusion

### Main claims:

- *ruguo* is like Kratzer's  $\Box^{epi}$ , but it surfaces overtly.
- In some forms of deontic conditionals,  $\Box^{epi}$  is available; in others, it is not (contra Frank 1996).
- It predicts correctly that *if*-clauses in *ruguo*-conditionals never restrict quantificational elements in the consequent.

### Future work:

- In epistemic conditionals, the distribution of *ruguo* doesn't appear fully as expected, but there is a possible way-out (see Appendix IV).

Thank you!!

## Appendix

## Appendix I: An epistemic reading of (15)

- With the help of adverbials that refer to **specific events**, we obtain an **epistemic reading instead**.  
cf. Farkas and Sugioka (1983)
- The distribution of *ruguo*- and *ruguo*-less conditionals gets reversed **as expected**.
- E.g. *cong zheli dao shanding* 'from here to the summit' in (20):

(20) During a mountain hike, the father says to his son...

a. ✓ **ruguo cong zheli dao shanding haibai shangsheng 100 mi,**  
RUGUO from here to summit altitude increase 100 meter  
*women daoda shi wendu jiu hui xiajiang 0.6 du.*  
we arrive time temp. JIU will drop 0.6 degree

b. ?? **cong zheli dao shanding haibai shangsheng 100 mi, women**  
from here to summit altitude increase 100 meter we  
*daoda shi wendu jiu hui xiajiang 0.6 du.*  
arrive time temp. JIU will drop 0.6 degree

‘\*When/✓ If the altitude from here to the summit increases by 100 meters, the temperature will decrease by 0.6 degree when we arrive.’

## Appendix II: An epistemic reading of (17)

- With the help of adverbs in the antecedent that refer to **specific events**, we can force adverbs of quantification to be interpreted **as part of the consequent**.
- Again, the distribution of *ruguo*- and *ruguo*-less conditionals gets reversed **as expected**.
- E.g. *mingnian* 'next year' in (21):

- (21) A couple is planning to reform their old house...
- a. ✓ **ruguo** **mingnian** *yushui duo, jiu hui jingchang lou shui.*  
RUGUO next.year rain many JIU will always leak water
- b. ?? **mingnian** *yushui duo, jiu hui jingchang lou shui.*  
next.year rain many JIU will often leak water  
 lit. 'If it rains a lot next year, it will leak very often.'

The position where Q-adverbs appear also seem to play a role:

- Conditional-initial *jingchang* makes it easier for *if*-clauses to restrict *jingchang*, cf. (17);
- *jingchang* inside the consequent makes it easier for *if*-clause to restrict an epistemic modal, cf. (21). See similar contrast in German in Frank (1996): 60–61.



## Appendix III: An epistemic reading of (19)

- Likewise, if the antecedent refers to **specific events**, nominal quantifiers in the matrix clause get interpreted as **part of the consequent**.
- Here, too, the distribution of *ruguo*- and *ruguo*-less conditionals gets reversed **as expected**.
- E.g. *zai zheci tijian zhong* 'in this health examination' in (22):

(22) The company organized a health examination for its employees. While waiting for the results, the doctor says...

a. ✓ *ruguo zai zheci tijian zhong chachu le zhifanggan,*  
 RUGUO in this health.exam in diagnose PERF hyperlipidemia  
*xuduoren jiu hui gaibian ziji de yinshi xiguan.*  
 many.ppl JIU change PERF self GEN diet habit

b. ??*zai zheci tijian zhong chachu le zhifanggan, xuduoren jiu*  
 in this health.exam in diagnose PERF hyperlipidemia many.ppl JIU  
*hui gaibian ziji de yinshi xiguan.*  
 change PERF self GEN diet habit  
 lit. 'If they are diagnosed with hyperlipidemia, many of them will change their diet.'

# Appendix IV: Epistemic conditionals

For epistemic conditionals with no overt epistemic modals

- Prediction:
  - *ruguo*-conditionals are ok;
  - *ruguo*-less conditionals are bad, since there's no operator for the *if*-clauses to restrict.
- Result: borne out.

(23) Ming went home by train yesterday, but I forgot if he was on the express train or the normal train...

a. ✓ *ruguo ta zuo le kuaiche, xianzai jiu yijing daojia le.*  
IF he take PERF express now JIU already arrive home PERF

b. ??*ta zuo le kuaiche, xianzai jiu yijing daojia le.*  
he take PERF express now JIU already arrive home PERF  
 'If he took the express train, he has arrived by now.'

But...

For epistemic conditionals with overt epistemic modals in the consequent

- Prediction:
  - *ruguo*-conditionals are ok;
  - *ruguo*-less conditionals are ok, *if*-clauses restrict the overt epistemic modal.
- Result: *not borne out*, e.g. with *yinggai* 'should (epistemic)' in (24).

- (24) a. ✓ *ruguo ta zuo le manche, jiu yinggai kuai dao le.*  
 RUGUO he take PERF slow.train JIU should almost arrive PERF
- b. ??*ta zuo le manche, jiu yinggai kuai dao le.*  
 he take PERF slow.train JIU should almost arrive PERF  
 'If he took the normal train, he should be arriving soon.'

A possible way-out for future work:

The surprising oddness of *ruguo*-less conditionals in overtly modalized epistemic conditionals may be explained by appealing to a more general distinction between the multi-case vs. one-case readings of conditionals (Kadmon 1987):

- **Multi-case** reading: generic flavor, quantification over situations

(25) If a semanticist hears of a good job, she applies for it. Kadmon (1987): 234 (178)

- **One-case** reading: non-generic, epistemic flavor, quantification over worlds

(26) If it's true that Sally heard of a good job, she applied for it.

- *ruguo*-less conditionals are unambiguously **multi-case** conditionals: *if*-clause restricts generic operator or adverbs of quantification; so, always generic.
- *ruguo*-conditionals are unambiguously **one-case** conditionals: prejacent of *ruguo* always restrict *ruguo*; so, always epistemic.

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