Singularity and plurality of discourse reference to worlds

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1. Introduction

2. Data

3. Independent assumption: Q-adverbial vs. modal quantification

4. Analysis

5. Summary
Introduction

Conditionals have been standardly analyzed under Kratzer’s restrictor analysis.
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Today: A common assumption that conditional antecedents are plural definite descriptions.

(e.g. Schein 2001; Schlenker 2004)
The plural view: Quantificational adverbs and *when*-clause restrictors

Compare:

(2) *When Anil died, his wife usually killed herself.*

⇒ *When*-clause describes a unique event.

(3) *When an Indian died, his wife usually killed herself.* (de Swart 1996)

⇒ *When*-clause describes multiple events.

⇒ Usually must be restricted by *when*-clauses that describe multiple events.

Hence the general constraint (de Swart 1996):

Quantificational adverbs (Q-adverbs) require non-singleton restrictors.
The plural view: Quantificational adverbs and when-clause restrictors

Compare: *Usually* + *when*-clauses
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Hence the general constraint (de Swart 1996):

**Quantificational adverbs (Q-adverbs) require non-singleton restrictors.**
The plural view: Q-adverbs and if-clause restrictors

Q-adverbs can also be restricted by English if-clauses (Lewis 1975):

(4) If Mary shows up, John usually shows up, too.
≈ 'Most situations where Mary comes are situations where John comes.'

Q-adverbs were shown to require restrictors that pick out non-singleton sets. By that, the if-clause of (4) also describes multiple events.

Standard assumption: If-clauses always refer to pluralities. (e.g. Schein 2001; Schlenker 2004):

in conditionals expressing adv. quantification (Q-adverbial conditionals);

as well as in those expressing modal quantification (modal conditionals):

(5) If Mary shows up, John might show up, too.
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Mystery: Japanese has a conditional marker that is compatible only with modal conditionals and resists Q-adverbial conditionals. This challenges the assumption that the antecedents of both Q-adverbial and modal conditionals refer to plural objects. Main claim: Conditional antecedents can refer to singular referents.
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Main claim: Conditional antecedents can refer to singular referents.
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Conditionals in Japanese

Obligatorily marked by verbal suffixes/enclitics in the antecedent:


'If Mary comes, John also comes.'

The antecedent can sometimes also be accompanied by moshi:

(7) moshi moshi Mary-ga M-nom ku-reba, come-reba John-mo J-add kuru. come

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Q-adverbial conditionals in Japanese

With the Q-adverb `taitei` 'usually', Q-adverbial reading:

(8) hikouki-ni plane-dat nor-eba, get.on-reba taitei usually kibun-ga feeling-nom waruku bad naru.

'If I get on a plane, I usually feel sick.'

≈ Most situations where I get on a pln. are situations where I feel sick.

Moshi + taitei `usually`: Unacceptable (Kaufmann 2017a, credited to Ikumi Imani)

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Modal conditionals in Japanese

(10) 
{moshi moshi} John-ga J-nom ku-reba, come-reba Mary-mo M-add kuru come kamo-shirenai. 

'might' 'If John shows up, Mary might show up, too.'

(11) 
{moshi moshi} John-ga J-nom ku-reba, come-reba tabun maybe Mary-mo M-add kuru. 

'maybe' 'If John shows up, maybe Mary will show up, too.'
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Moshi and covert operators

Generic conditionals have a covert GEN-operator that is similar to usually (Farkas and Sugioka 1983); Moshi is disallowed (Kaufmann 2017b):

\( \{\# \text{moshi} / \emptyset \} \text{ taiyou-ga sun-nom shizum-eba, sink-cond yoru-ni dat naru.} \)

'It becomes night if the sun goes down.'

Ambiguity between covert always and covert must:

\( \{\text{Mary-ga M-nom ku-reba, come-reba John-mo J-add kuru.} \}

'If Mary comes, John also comes.' All M-coming situations are J-coming situations. (covert always)

If M comes (tmr), it must be the case that J will come. (covert must)

With moshi, epistemic reading only:

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Taking stock

Q-adverbial conditionals were used to motivate the view that conditional antecedents refer to plural objects. Conditionals that contain moshi lack Q-adverbial readings. ⇒ Moshi-antecedents do not refer to plural referents. But why is moshi allowed in modal conditionals, then? What's the difference between Q-adverbial and modal conditionals such that moshi is allowed in modal conditionals, but not in Q-adverbial conditionals?
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Kratzer’s view on Q-adverbial and modal quantification

Both Q-adverbs and modals are restricted by conditional antecedents:

(15) If Mary comes, John sometimes comes, too.

\[ \exists s [\text{mary-come}(s) \land \text{john-come}(s)] \]

(16) If Mary comes, John might come, too.

\[ \exists w' [R_{\text{epi}} w' \& \text{mary-come}(w') \land \text{john-come}(w')] \]

But there's converging evidence that this construal for modals is incorrect.

(Frank 1996; Zvolenszky 2002 a.o.)
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\[ \exists w' \left[ w \in \text{Rep} w' \right] \left[ \text{mary-come}(w') \right] \left[ \text{john-come}(w') \right] \]

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(Frank 1996; Zvolenszky 2002 a.o.)
Evidence from deontic conditionals

If the new laws pass, salespeople will have to work longer. (Frank 1996)

Kratzer-style construal:

∀w′ [w@Rdeo w′ & law-pass (w′)] [work-longer (w′)]

Suppose at w@: Actual laws don't require work-longer; new laws would, but they haven't passed. Intuition: True. Prediction: False.

The necessity of work-longer gets evaluated w.r.t. the laws at w@; according to them, salespeople don't need to work longer.

Core assumption: Modals in conditionals are not restricted by antecedents, but evaluated pointwise at antecedent worlds (e.g. at each law-pass-world).
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\[(18) \forall w' [w \in R_{de} \land \text{law-pass}(w')] [\text{work-longer}(w')]\]
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  **Prediction: False.**
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- Kratzer-style construal:

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- Suppose at $w@$: Actual laws don’t require work-longer; new laws would, but they haven’t passed.

Intuition: True.

**Prediction: False.** The necessity of work-longer gets evaluated w.r.t. the laws at $w@$; according to them, salespeople don’t need to work longer.
Evidence from deontic conditionals

(17) If the new laws pass, salespeople will have to work longer. (Frank 1996)

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  (18) \( \forall w' \ [w_R^{deo} w' & \text{law-pass}(w')] [\text{work-longer}(w')] \)

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- (18): The criteria that we use to evaluate have to are independent of the content of the antecedent, i.e. \text{law-pass}.

- What we need: \text{law-pass} should ‘feed into’ the criteria that we use to evaluate have to.
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Core assumption:
Modals in conditionals are not restricted by antecedents, but evaluated pointwise at antecedent worlds (e.g. at each law-pass-world).
1. Introduction

2. Data

3. Independent assumption: Q-adverbial vs. modal quantification

4. Analysis

5. Summary
Framework: Intensional Plural Compositional DRT (Brasoveanu 2010)
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Four basic types:
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Four basic types:
- $t$: truth values
Framework: Intensional Plural Compositional DRT (Brasoveanu 2010)

Four basic types:

- $t$: truth values
- $e$: individuals

$I = \{i_1, i_2, i_3\}$
$u(i_3) = \text{bill}$
$p(i_3) = w_3$
Framework: Intensional Plural Compositional DRT (Brasoveanu 2010)

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<table>
<thead>
<tr>
<th>$l$</th>
<th>$u$</th>
<th>$p$</th>
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</thead>
<tbody>
<tr>
<td>$i_1$</td>
<td>mary</td>
<td>$w_1$</td>
</tr>
<tr>
<td>$i_2$</td>
<td>john</td>
<td>$w_2$</td>
</tr>
<tr>
<td>$i_3$</td>
<td>bill</td>
<td>$w_3$</td>
</tr>
</tbody>
</table>

$l = \{i_1, i_2, i_3\}$

$u(i_3) = \text{bill}$

$p(i_3) = w_3$
Interpretation of sentences

Sentences denote relations between info states.

(19) Sentence ⇝ \[ newdrefs | conditions \] := \( \lambda I \langle s, t \rangle . \lambda J \langle s, t \rangle . I [ newdrefs ] J \land conditions J \), or \[ conditions \] := \( \lambda I \langle s, t \rangle . \lambda J \langle s, t \rangle . conditions J \).

Singularity condition: Requires the relevant dref to store exactly one value w.r.t. each info state.

(20) A \( \text{v} \) mouse came. It \( \text{v} \) laughed. ⇝ \[ \text{v} | sing(\text{v}) \]; \[ mouse \{ \text{v} \} \]; \[ laughed \{ \text{v} \} \)
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$\text{[newdrefs | conditions]} := \lambda I_{⟨s,t⟩}.\lambda J_{⟨s,t⟩}.I[\text{newdrefs}] J \land \text{conditions} J$, or

$\text{Singularity condition: Requires the relevant dref to store exactly one value w.r.t. each info state.}$

(20) A $\text{mouse came. It laughed.}$

$\rightsquigarrow \text{[v | \text{sing}(v)]; [mouse \{v\}; [laughed \{v\}]})$
Interpretation of sentences

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$[\text{newdrefs} \mid \text{conditions}] := \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} \cdot I[\text{newdrefs}] \land \text{conditions} J$, or

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\left[\text{newdrefs} \mid \text{conditions}\right] := \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} . I[\text{newdrefs}] J \land \text{conditions} J, \text{ or }
\]

\[
\left[\text{conditions}\right] := \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} . \text{conditions} J
\]

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(20) A$^v$ mouse came. It$^v$ laughed.
Interpretation of sentences

Sentences denote relations between info states.

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[conditions] := $\lambda I_{\langle s, t \rangle} \cdot \lambda J_{\langle s, t \rangle} \cdot I[\text{newdrefs}] J \land \text{conditions}_J$, or
[conditions] := $\lambda I_{\langle s, t \rangle} \cdot \lambda J_{\langle s, t \rangle} \cdot \text{conditions}_J$

Singularity condition: Requires the relevant dref to store exactly one value w.r.t. each info state.

(20) A$^v$ mouse came. It$^v$ laughed.
$\leadsto$ [v|sing(v)]; [mouse{v}]; [laughed{v}]

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**Singularity condition:** Requires the relevant dref to store **exactly one value** w.r.t. each info state.

(20) $A^v$ mouse came. It$_v$ laughed.

$\rightsquigarrow$ $[v | \text{sing}(v)]; \ [\text{mouse}\{v\}]; \ [\text{laughed}\{v\}]$

$I_0$


Interpretation of sentences

Sentences denote relations between info states.

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$$[\text{newdrefs | conditions}] := \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} \cdot I[\text{newdrefs}] J \land \text{conditions} J,$$ or

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$\rightsquigarrow [v|\text{sing}(v)]; [\text{mouse}\{v\}]; [\text{laughed}\{v\}]$

$$
\begin{array}{c}
\begin{array}{c}
  [v|\text{sing}(v)]
  \downarrow\downarrow\downarrow
  \begin{array}{c}
    i_1 \quad \text{jerry}
  \end{array}
  \downarrow\downarrow\downarrow
  \begin{array}{c}
    i_2 \quad \text{mickey}
  \end{array}
  \downarrow\downarrow\downarrow
  \begin{array}{c}
    i_3 \quad \text{tom}
  \end{array}

deletedtext
\end{array}
\end{array}
$$
Interpretation of sentences

Sentences denote relations between info states.

\[(19) \text{Sentence } \leadsto \]
\[\text{[newdrefs | conditions]} := \lambda I_{s,t} \cdot \lambda J_{s,t} \cdot I[\text{newdrefs}] J \land \text{conditions} J, \text{ or}
\[\text{[conditions]} := \lambda I_{s,t} \cdot \lambda J_{s,t} \cdot \text{conditions} J\]

**Singularity condition:** Requires the relevant dref to store exactly one value w.r.t. each info state.

\[(20) \text{A}^v \text{ mouse came. It}_v \text{ laughed. } \]
\[\leadsto [v|\text{sing}(v)]; [\text{mouse}\{v\}]; [\text{laughed}\{v\}]\]

\[
\begin{array}{ccc}
\begin{array}{|c|}
\hline
\end{array} & \[
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\hline
i_1 & \text{jerry} \\
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i_2 & \text{mickey} \\
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\]
Interpretation of sentences

Sentences denote relations between info states.

(19) Sentence ➞

\[ \text{[newdrefs | conditions]} \equiv \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} \cdot I[\text{newdrefs}] \land \text{conditions} J, \text{ or } \]

\[ \text{[conditions]} \equiv \lambda I_{(s,t)} \cdot \lambda J_{(s,t)} \cdot \text{conditions} J \]

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\( \equiv [v | \text{sing}(v)]; \ [\text{mouse}\{v\}]; \ [\text{laughed}\{v\}] \)

\[ \text{I}_0 \]

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Introducing situation drefs: Default case
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**Conditional connectives introduce new drefs** that store all situations verifying the antecedent proposition (Brasoveanu 2010 for English):
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(21)  

  a.  If\(^q\) I get on a plane, ...

  b.  \textit{hikouki-ni nor-reba}^q, ...

    plane-dat   get.on-reba
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(21)  

a. \( \text{If}^q \text{ I get on a plane, ...} \)  

b. \( \text{hikouki-ni nor-reba}^q, \ldots \)  
   plane-dat get.on-reba

\( \rightsquigarrow \text{max}^q([\text{I-get-on-a-plane}_q]) \)
Conditional connectives introduce new drefs that store all situations verifying the antecedent proposition (Brasoveanu 2010 for English):

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    b. hikouki-ni nor-reba$_q$, ...
    plane-dat get.on-reba

\[ \leadsto \max^q([I\text{-}get\text{-}on\text{-}a\text{-}plane_q]) \]
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    b. *hikouki-ni nor-reba*\(^q\), ...

\[ \sim \max^q([I\text{-}get\text{-}on\text{-}a\text{-}plane_\text{q}]) \]

\[
\begin{array}{c|c|c}
   & l_0 & \max^q([I\text{-}get\text{-}on\text{-}a\text{-}plane_\text{q}]) \\
   l & \text{q} & \text{w}
\end{array}
\]

\[\begin{array}{c|c}
   i_1 & w_1 \\
   i_2 & w_2 \\
   i_3 & w_3 \\
\end{array}\]
Introducing situation drefs: Singularity

Proposal:

Moshi is an overt marker of singularity:

(22)

moshi

p

moshi

hikouki-ni

plane-

dat

nor-reba

q

⊑

p

p

ride-

reba

...

‘If I get on a plane, ...’

⇝

[p | sing(p)];

max

q

⊑

p

( [I-get-on-a-plane q ])

It stores exactly one situation in each info state.

-Reba is anaphoric to moshi and stores a subset of the value stored by moshi.
Proposal: *Moshi* is an overt marker of singularity:
Introducing situation drefs: Singularity

Proposal: Moshi is an overt marker of singularity:

(22) \[ m\text{oshi}^p \ h\text{i}k\text{ouki-ni} \ n\text{or-reba}^q_{\leq p}, \ldots \]
moshi plane-dat ride-reba
‘If I get on a plane, …’
Introducing situation drefs: Singularity

Proposal: *Moshi* is an overt marker of singularity:

(22) \( \text{moshi}^p \text{ hikouki-ni nor-reba}^q_p \subseteq p \), ...

`moshi` plane-dat ride-reba

‘If I get on a plane, …’

\( \rightsquigarrow [p|\text{sing}(p)]; \max^q_p ([\text{I-get-on-a-plane}_q]) \)
Introducing situation drefs: Singularity

Proposal: **Moshi** is an overt marker of singularity:

\[(22)\] \(\text{moshi}^p \text{ hikouki-ni nor-reba}_p^q \subseteq p, \ldots\)

moshi plane-dat ride-reba
‘If I get on a plane, …’

\(\sim \ [p|\text{sing}(p)]; \max^q \subseteq p([\text{I-get-on-a-plane}_q])\)

- It stores **exactly one situation** in each info state.
Introducing situation drefs: Singularity

Proposal: **Moshi** is an overt marker of singularity:

(22) \( moshi^p \) hikouki-ni nor-reba\(_p^q \subseteq p \), ...
    moshi plane-dat ride-reba
    ‘If I get on a plane, ...’
    \( \leadsto [p|\text{sing}(p)]; \max^q \subseteq p ([I-get-on-a-plane_q]) \)

- It stores **exactly one situation** in each info state.
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Introducing situation drefs: Singularity

Proposal: *Moshi* is an overt marker of singularity:

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moshi plane-dat ride-reba

‘If I get on a plane, ...’

\( \sim [p|\text{sing}(p)]; \max^q \subseteq p ([\text{I-get-on-a-plane}_q]) \)

- It stores **exactly one situation** in each info state.
- -Reba is anaphoric to *moshi* and stores a subset of the value stored by *moshi*.

\[
\begin{array}{c}
\begin{array}{c|c}
\text{l}_0 & \text{i}_1 \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{l}' & \text{p} \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{i}_1 & \text{w}_1 \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{l}'' & \text{p} \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{i}_2 & \text{w}_2 \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{l}''' & \text{p} \\
\hline
\end{array} \\
\begin{array}{c|c}
\text{i}_3 & \text{w}_3 \\
\hline
\end{array} \\
\vdots
\end{array}
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Introducing situation drefs: Singularity

Proposal: **Moshi** is an overt marker of singularity:

(22) \( moshi^p \ hikouki-ni \ nor-reba^q_{p \sqsubseteq p} \), ...

\( \text{moshi} \ \text{plane-dat} \ \text{ride-reba} \)

‘If I get on a plane, ...’

\( \sim \ [p|\text{sing}(p)]; \max^q_{p}([\text{I-get-on-a-plane}_q]) \)

- **It stores exactly one situation** in each info state.
- **-Reba** is anaphoric to **moshi** and stores a subset of the value stored by **moshi**.

\[
\begin{array}{|c|c|c|}
\hline
& i' & p \\
\hline
i_1 & w_1 \\
\hline
\end{array}
\quad
\begin{array}{|c|c|c|}
\hline
& j' & p & q \\
\hline
j_1 & w_1 & w_1 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|c|}
\hline
& i'' & p \\
\hline
i_2 & w_2 \\
\hline
\end{array}
\quad
\begin{array}{|c|c|c|}
\hline
& j'' & p & q \\
\hline
j_2 & w_2 & w_2 \\
\hline
\end{array}
\]

\[
\begin{array}{|c|c|c|}
\hline
& i''' & p \\
\hline
i_3 & w_3 \\
\hline
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\quad
\begin{array}{|c|c|c|}
\hline
& j''' & p & q \\
\hline
j_3 & w_3 & w_3 \\
\hline
\end{array}
\]

\[ \ldots \]
Introducing situation drefs: Singularity

Proposal: **Moshi is an overt marker of singularity:**

(22) \( \text{moshi}^p \text{hikouki-ni nor-reba}^q \subseteq_p, \ldots \)

moshi plane-dat ride-reba
‘If I get on a plane, …’

\( \rightsquigarrow [p|\text{sing}(p)]; \max^q \subseteq_p ([I-get-on-a-plane]) \)

- It stores **exactly one situation** in each info state.
- **Reba** is anaphoric to *moshi* and stores a subset of the value stored by *moshi*.

Singularity of \( p \) is inherited by \( q \) in each info state.
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. usually $r \sqsubseteq q$)
an anaphorically retrieved dref $q$ that stores restrictors,
a newly established dref $r$ that stores nuclear scopes;
Due to conservativity, the nuclear scope dref is a structured subset ($\sqsubseteq$) of
the restrictor dref.

Q-adv cond'ls: restrictor drefs are provided by antecedents anaphorically.

(23) hikouki-ni plane-dat nor-reba $q$, get.on-reba $r \sqsubseteq q$,
usually kibun-ga feeling-nom waruku bad-naru.

(23) $\Rightarrow$ max $q([I-get-on-a-plane q])$; max $r \sqsubseteq q([I-feel-sick r])$;
\[
\text{[MOST} \{q, r\}] \rightarrow q w_1 w_2 w_3 \leftarrow r w_1 w_2 w_3 \star
\]
\[
\text{[MOST} \{q, r\}] \rightarrow q r w_1 w_2 w_3 \star
\]
($\star$ is a dummy situation that falsifies all propositions)
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. $\textit{usually}^q_r \subseteq q$)
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. \( \text{usually}_{q \sqsubseteq r} \))

- an anaphorically retrieved dref \( q \) that stores restrictors,
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. usually\( q \sqsubseteq r \))

- an anaphorically retrieved dref \( q \) that stores restrictors,
- a newly established dref \( r \) that stores nuclear scopes;
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. $usually^r_{q \sqsubseteq q}$)

- an anaphorically retrieved dref $q$ that stores restrictors,
- a newly established dref $r$ that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset ($\sqsubseteq$) of the restrictor dref.

(23) hikouki-ni plane-dat nor-reba $q$, get.on-reba taitei $r \sqsubseteq q$ usually kibun-ga feeling-nom waruku bad become
'If I get on a plane, I usually feel sick.'

(23) $\Rightarrow$ max $q\{ [I-get-on-a-plane q]; max r \sqsubseteq q\{ [I-feel-sick r] \}; MOST{q, r}\}$

max $q\{ [I-go-plane q] \} \longrightarrow w_1 w_2 w_3$

max $r \sqsubseteq q\{ [I-feel-sick r] \} \longrightarrow w_1 w_2 w_3 \ast$

($\ast$ is a dummy situation that falsifies all propositions)
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. $usually^q_r$)

- an anaphorically retrieved dref $q$ that stores restrictors,
- a newly established dref $r$ that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset ($\subseteq$) of the restrictor dref.

Q-adv cond’ls: **restructor drefs are provided by antecedents** anaphorically.
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. \( \texttt{usually}_q^r \))

- an anaphorically retrieved dref \( q \) that stores restrictors,
- a newly established dref \( r \) that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset (\( \sqsubseteq \)) of the restrictor dref.

Q-adv cond’ls: restrictor drefs are provided by antecedents anaphorically.

(23) \( \texttt{hikouki-ni nor-reba}^q, \texttt{taitei}^r_q \texttt{kibun-ga waruku naru.} \)
plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. \( \text{usually}_q \subseteq_q \))
- an **anaphorically retrieved dref** \( q \) that stores restrictors,
- a **newly established dref** \( r \) that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset (\( \subseteq \)) of the restrictor dref.

Q-adv cond’ls: **restrictor drefs are provided by antecedents** anaphorically.

(23)  
\[ \text{hikouki-ni nor-reba}^q, \text{taitei}^r \subseteq_q \text{kibun-ga waruku} \text{naru.} \]  
plane-dat get.on-reba usually feeling-nom bad become  
‘If I get on a plane, I usually feel sick.’

(23) \( \leadsto \max^q([\text{I-get-on-a-plane}_q]); \max^r \subseteq_q ([\text{I-feel-sick}_r]); [\text{MOST}\{q, r\}] \)
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. \( usually^r_q \))
- an anaphorically retrieved dref \( q \) that stores restrictors,
- a newly established dref \( r \) that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset \((\subseteq)\) of the restrictor dref.

Q-adv cond’ls: restrictor drefs are provided by antecedents anaphorically.

(23) \textit{hikouki-ni nor-reba}^q, \textit{taitei}^r_q \textit{kibun-ga} \textit{waruku} \textit{naru}.

\text{plane-dat get.on-reba usually feeling-nom bad become}
\text{‘If I get on a plane, I usually feel sick.’}

(23) \( \leadsto \max^q([I-get-on-a-plane_q]); \max^r_q([I-feel-sick_r]); [\text{MOST}\{q, r\}] \)

\[
\begin{array}{c}
\max^q([I-g.o.-plane_q])
\end{array} \rightarrow
\begin{array}{c}
q \\
\downarrow
\begin{array}{c}
w_1 \\
w_2 \\
w_3
\end{array}
\end{array}
\]
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. *usually*\(_q^{r \subseteq q}\))

- an anaphorically retrieved dref *q* that stores restrictors,
- a newly established dref *r* that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset (\(\subseteq\)) of the restrictor dref.

Q-adv cond’ls: **restrictor drefs are provided by antecedents** anaphorically.

\[(23) \quad \text{hikouki-ni nor-reba}^q, \text{taitei}^r_q \subseteq q \text{ kibun-ga waruku naru.} \]

plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’

\[(23) \quad \leadsto \max^q([I\text{-get-on-a-plane}_q]); \max^r \subseteq q([I\text{-feel-sick}_r]); [\text{MOST}\{q, r\}] \]

\[\begin{array}{c}
\text{max}^q([I\text{-g.o.-plane}_q]) \\
\text{max}^r \subseteq q([I\text{-feel-sick}_r])
\end{array}\]
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. usually$^r_{\sqsubseteq q}$)

- an anaphorically retrieved dref $q$ that stores restrictors,
- a newly established dref $r$ that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset ($\sqsubseteq$) of the restrictor dref.

Q-adv cond’ls: **restrictr drefs are provided by antecedents** anaphorically.

(23) *hikouki-ni nor-reba$^q$, taitei$^r_{\sqsubseteq q}$ kibun-ga waruku naru.*
plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’

(23) $\implies max^q([I\text{-get-on-a-plane}_q]); max^r_{\sqsubseteq q}([I\text{-feel-sick}_r]); [MOST\{q, r\}]$

\[
\begin{align*}
\text{max}^q([I\text{-g.o.-plane}_q]) &\rightarrow q \quad W_1 \quad W_2 \quad W_3 \\
\text{max}^r_{\sqsubseteq q}([I\text{-feel-sick}_r]) &\rightarrow q \quad r \quad W_1 \quad W_2 \quad W_3 \quad \star
\end{align*}
\]

(* is a dummy situation that falsifies all propositions)
Q-adverbial conditionals: Basic implementation

Q-adverbs express a set relation between two drefs (e.g. $\text{usually}^q_r$)

- an anaphorically retrieved dref $q$ that stores restrictors,
- a newly established dref $r$ that stores nuclear scopes;
- Due to conservativity, the nuclear scope dref is a structured subset ($\subseteq$) of the restrictor dref.

Q-adv cond’ls: restrictor drefs are provided by antecedents anaphorically.

(23) $\text{hikouki-ni nor-reba}^q_r, \text{taitei}^r_q \text{kibun-ga waruku naru}$.  
plane-dat get.on-reba usually feeling-nom bad become  
‘If I get on a plane, I usually feel sick.’

(23) $\leadsto \text{max}^q([\text{I-get-on-a-plane}_q]); \text{max}^r\subseteq^q([\text{I-feel-sick}_r]); [\text{MOST}\{q, r\}]$

\[ \begin{array}{c|c}
\text{max}^q([\text{I-g.o.-plane}_q]) & \begin{array}{c|c}
q & r \\
W_1 & W_1 \\
W_2 & W_2 \\
W_3 & \star \\
\end{array}
\end{array} \]

\[ \begin{array}{c|c|c}
\text{max}^{\subseteq^q([\text{I-feel-sick}_r])} & \begin{array}{c|c}
q & r \\
W_1 & W_1 \\
W_2 & W_2 \\
W_3 & \star \\
\end{array}
\end{array} \]

\[ \begin{array}{c|c|c}
\text{[MOST}\{q, r\}] & \begin{array}{c|c}
q & r \\
W_1 & W_1 \\
W_2 & W_2 \\
W_3 & \star \\
\end{array}
\end{array} \]

\(*\) is a dummy situation that falsifies all propositions
Q-adverbial conditionals: Explaining oddness of *moshi*
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*\(^p\) hikouki-ni nor-reba\(^q\subseteq p\), taitei\(^r\subseteq q\) kibun-ga waruku naru.

moshi plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*[^\(24\)]^p  hikouki-ni nor-reba[^\(q\)]^p  _taitei[^r\(q\)]^q  kibun-ga waruku naru.

moshi  plane-dat  get.on-reba  usually  feeling-nom  bad  become

‘If I get on a plane, I usually feel sick.’

\sim [p|\text{sing}(p)]; \text{max}[^q\subseteq p([I\text{-g.}-plane_q])]; \text{max}[^r\subseteq q([I\text{-feel-sick}_r])]; [\text{MOST}\{q, r\}]
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*\(^p\) hikouki-ni nor-reba\(^q\subseteq p\), taitei\(^r\subseteq q\) kibun-ga waruku naru.

moshi plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’

\[ \sim [p|\text{sing}(p)]; \max^q\subseteq p([\text{I-g.-plane}_q]); \max^r\subseteq q([\text{I-feel-sick}_r]); [\text{MOST}\{q, r\}] \]
Q-adverbial conditionals: Explaining oddness of moshi

(24) "moshi\textsuperscript{p} hikouki-ni nor-reba\textsuperscript{q\subseteq p}, taitei\textsuperscript{r\subseteq q} kibun-ga waruku naru."

moshi plane-dat get.on-reba usually feeling-nom bad become
‘If I get on a plane, I usually feel sick.’

\(\sim [p|\text{sing}(p)]; \max^{q\subseteq p}([I\text{-}g\text{-}plane\textsubscript{q}}]; \max^{r\subseteq q}([I\text{-}feelsick\textsubscript{r}]); [\text{MOST}\{q, r\}]\)

- Moshi introduces singularity;
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??**moshi**\(^p\) \(\text{hikouki-ni nor-reba}^{q\sqsubseteq p}\), **taitei**\(^r\sqsubseteq q\) *kibun-ga waruku naru.*

moshi plane-dat get.on-reba usually feeling-nom bad become

‘If I get on a plane, I usually feel sick.’

\[\sim [p|\text{sing}(p)]; \max^{q\sqsubseteq p}([I-\text{g.-plane}_q]); \max^{r\sqsubseteq q}([I-\text{feel-sick}_r]); [\text{MOST}\{q, r\}]\]

- *Moshi* introduces singularity;

```
\[
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
p \\
\text{w}_3 \\
\vdots
\end{array}
\quad \xrightarrow{[p|\text{sing}(p)]}
\quad \begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
p \\
\text{w}_3 \\
\vdots
\end{array}
\]  
```

\[\max^{q\sqsubseteq p}([I-\text{g.o.-plane}_q]) \]
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*\(^p\) hikouki-ni nor-reba\(^q\subseteq p\), taitei\(^r\subseteq q\) kibun-ga waruku naru.

*moshi* plane-dat get.on-reba usually feeling-nom bad become

‘If I get on a plane, I usually feel sick.’

\[\leadsto [p|\text{sing}(p)]; \max^q\subseteq p([I\text{-}g\text{-}o\text{-}plane_q]); \max^r\subseteq q([I\text{-}feelsick_r]); [\text{MOST}\{q, r\}]\]

- *Moshi* introduces singularity;

```
[p|\text{sing}(p)] \rightarrow w_1 \rightarrow w_1 \rightarrow w_2 \rightarrow w_2 \rightarrow w_3 \rightarrow w_3 \rightarrow \ldots
```

```
p q
\begin{array}{c|c}
w_1 & w_1 \\
p q
\end{array}
max^q\subseteq p([I\text{-}g\text{-}o\text{-}plane_q])

\begin{array}{c|c|c}
w_1 & w_1 & w_1 \\
p q
\end{array}
max^r\subseteq q([I\text{-}feelsick_r])
```

\[\leadsto \emptyset\]
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) **moshi**\(^p\) hikouki-ni nor-reba\(_p\)\(^q\)\(_\sqsubseteq\)\(_p\), **taitei**\(_q\)\(^r\)\(_\sqsubseteq\)\(_q\) kibun-ga waruku naru.

moshi  plane-dat  get.on-reba  usually  feeling-nom  bad  become

‘If I get on a plane, I usually feel sick.’

\[\sim [p|\text{sing}(p)]; \max^q\subseteq_p([I-g.-plane_\_q]); \max^r\subseteq_q([I-feel-sick_\_r]); \text{[MOST}\{q, r\}\text{]}\]

- **Moshi** introduces singularity;
- inherited by the antecedent dref (\(q\)) and nuclear-scope dref (\(r\));

\[
\begin{array}{ccc}
p & q & r \\
\bullet & \bullet & \bullet \\
\end{array}
\]
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*\(^p\) hikouki-ni nor-reba\(_p\) \(q\sqsubseteq p\), *taitei*\(_q\) \(r\sqsubseteq q\) kibun-ga waruku naru.

‘If I get on a plane, I usually feel sick.’

\(\sim [p|\text{sing}(p)]; \max q\sqsubseteq p([I\text{-g.}-\text{plane}_q]); \max r\sqsubseteq q([I\text{-feel-sick}_r]); \text{[MOST}\{q, r\}\text{]}\)

- *Moshi* introduces singularity;
- inherited by the antecedent dref \((q)\) and nuclear-scope dref \((r)\);

\[
\begin{array}{c}
\text{\([p|\text{sing}(p)]\)} \quad \text{\(\max q\sqsubseteq p([I\text{-g.}-\text{plane}_q])\)} \quad \text{\(\max r\sqsubseteq q([I\text{-feel-sick}_r])\)} \quad \text{\(\text{[MOST}\{q, r\}\text{]}\)}
\end{array}
\]

\[
\begin{array}{c}
p\quad p\quad p
\end{array}
\]

\[
\begin{array}{c}
\text{\([p|\text{sing}(p)]\)} \quad \text{\(\max q\sqsubseteq p([I\text{-g.}-\text{plane}_q])\)} \quad \text{\(\max r\sqsubseteq q([I\text{-feel-sick}_r])\)} \quad \text{\(\text{[MOST}\{q, r\}\text{]}\)}
\end{array}
\]

\[
\begin{array}{c}
w_1\quad w_1\quad w_1
\end{array}
\]

\[
\begin{array}{c}
w_2\quad w_2\quad w_2
\end{array}
\]

\[
\begin{array}{c}
w_3\quad w_3\quad w_3
\end{array}
\]

\[
\begin{array}{c}
w_1\quad w_1\quad w_1
\end{array}
\]

\[
\begin{array}{c}
w_2\quad w_2\quad w_2
\end{array}
\]

\[
\begin{array}{c}
w_3\quad w_3\quad w_3
\end{array}
\]

\[
\begin{array}{c}
w_1\quad w_1\quad w_1
\end{array}
\]

\[
\begin{array}{c}
w_2\quad w_2\quad w_2
\end{array}
\]

\[
\begin{array}{c}
w_3\quad w_3\quad \star
\end{array}
\]

\[
\begin{array}{c}
\text{\(\text{[MOST}\{q, r\}\text{]}\)}
\end{array}
\]

\[
\begin{array}{c}
\text{\(\text{[MOST}\{q, r\}\text{]}\)}
\end{array}
\]

\[
\begin{array}{c}
\text{\(\text{[MOST}\{q, r\}\text{]}\)}
\end{array}
\]
Q-adverbial conditionals: Explaining oddness of *moshi*

\[(24) \quad ??\text{moshi}^p \text{ hikouki-ni nor-reba}_{q \sqsubseteq p}^p, \text{taitei}^q_{r \sqsubseteq q} \text{ kibun-ga waruku naru.}\]

moshi plane-dat get.on-reba usually feeling-nom bad become

‘If I get on a plane, I usually feel sick.’

\[\leadsto [p|\text{sing}(p)]; \max^q_{\sqsubseteq p}(\text{I-g.-plane}_q); \max^r_{\sqsubseteq q}(\text{I-feel-sick}_r); [\text{MOST}\{q, r\}]\]

- Moshi introduces singularity;
- inherited by the antecedent dref (q) and nuclear-scope dref (r);
- But adverbial quantification require **non-singleton** restrictors!

```
<table>
<thead>
<tr>
<th>p</th>
<th>q</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>w1</td>
<td>w1</td>
<td>w1</td>
</tr>
<tr>
<td>w2</td>
<td>w2</td>
<td>w2</td>
</tr>
<tr>
<td>w3</td>
<td>w3</td>
<td>w3</td>
</tr>
</tbody>
</table>
```

\[\leadsto [p|\text{sing}(p)]; \max^q_{\sqsubseteq p}(\text{I-g.-plane}_q); \max^r_{\sqsubseteq q}(\text{I-feel-sick}_r); [\text{MOST}\{q, r\}]\]
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) \( ??\) *moshi*\(^p\) hikouki-ni nor-reba\(^q\subseteq p\), taitei\(^r\subseteq q\) kibun-ga waruku naru.

moshi plane-dat get.on-reba usually feeling-nom bad become

‘If I get on a plane, I usually feel sick.’

\[ \sim [p|\text{sing}(p)]; \max^{q\subseteq p}([\text{I-g.-plane}_q]); \max^{r\subseteq q}([\text{I-feel-sick}_r]); [\text{MOST}\{q, r\}] \]

- *Moshi* introduces singularity;
- inherited by the antecedent dref (\(q\)) and nuclear-scpe dref (\(r\));
- But adverbial quantification require **non-singleton** restrictors!

...
Q-adverbial conditionals: Explaining oddness of *moshi*

(24) ??*moshi*<sub>p</sub> hikouki-ni nor-reba<sub>p,q</sub> taitei<sub>r,q</sub> kibun-ga waruku naru.

‘If I get on a plane, I usually feel sick.’

\[ \leadsto [p|\text{sing}(p)]; \max^{q\subseteq p}(\text{[I-g.-plane}_q]); \max^{r\subseteq q}(\text{[I-feel-sick}_{r}]); [\text{MOST}\{q, r\}] \]

- *Moshi* introduces singularity;
- inherited by the antecedent dref (*q*) and nuclear-scope dref (*r*);
- But adverbial quantification require **non-singleton** restrictors!

\[
\begin{array}{ccc}
\begin{array}{c}
p \\
[\text{[p|\text{sing}(p)]}]
\end{array}
& \xrightarrow{\max^{q\subseteq p}(\text{[I-g.-plane}_q])} & \begin{array}{c}
p \\
\text{w}_1
\end{array}
& \xrightarrow{\max^{q\subseteq p}(\text{[I-g.o.-plane}_q])} & \begin{array}{c}
p \\
\text{w}_2
\end{array}
& \xrightarrow{\max^{q\subseteq p}(\text{[I-g.o.-plane}_q])} & \begin{array}{c}
p \\
\text{w}_3
\end{array}
& \vdots
\end{array}
\]

\[
\begin{array}{ccc}
\begin{array}{c}
p \\
\text{w}_1
\end{array}
& \xrightarrow{\max^{r\subseteq q}(\text{[I-fl-sick}_{r}])} & \begin{array}{c}
p \\
\text{w}_2
\end{array}
& \xrightarrow{\max^{r\subseteq q}(\text{[I-fl-sick}_{r}])} & \begin{array}{c}
p \\
\text{w}_3
\end{array}
& \xrightarrow{\max^{r\subseteq q}(\text{[I-fl-sick}_{r}])} & \begin{array}{c}
p \\
\text{w}_3
\end{array}
& \xrightarrow{[\text{MOST}\{q, r\}]} & \emptyset
\end{array}
\]

*Moshi* prevents the antecedent from providing a meaningful restrictor for Q-adverbs.
Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. might $q_r \mathbin{\sqsubseteq} q_p$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),
2. a newly established restrictor dref ($q$), (contra Brasoveanu)
3. a newly established nuclear-scope dref ($r$); and express a set relation between $q$ and $r$.

E.g. $\phi$ might $q_r \mathbin{\sqsubseteq} q_p \mapsto \max q_r[\{R_{\text{epi}}\{p, q\}\}]; \max r \mathbin{\sqsubseteq} q_r[\{\text{SOME}\{q, r\}\}]$
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, **modals are not restricted by the antecedents.**
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. $\text{might}_{p,r \sqsubseteq q}$)
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. $\text{might}^q_r$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. $\text{might}^q_r \subseteq q$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),
2. a newly established restrictor dref ($q$),

(contra Brasoveanu)
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. \( \text{might}^q, r \sqsubseteq q \))

1. an anaphorically retrieved dref that stores evaluation situations (\( p \)),
2. a newly established restrictor dref (\( q \)),
3. a newly established nuclear-scope dref (\( r \));

...
Recall: Unlike Q-adverbs, ***modals are not restricted by the antecedents.***

New proposal for modals: associated with three drefs (e.g. $\text{might}^q_{p,r\sqsubseteq q}$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),

2. a **newly established restrictor dref** ($q$),

3. a newly established nuclear-scope dref ($r$);

and express a set relation between $q$ and $r$. 

Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, **modals are not restricted by the antecedents.**

New proposal for modals: associated with three drefs (e.g. $\text{might}^q, r \sqsubseteq q$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),
2. a **newly established restrictor dref** ($q$),
3. a newly established nuclear-scope dref ($r$); and express a set relation between $q$ and $r$.

E.g. $\phi \text{ might}^q, r \sqsubseteq q$
Modal conditionals: Basic implementation (modals)

Recall: Unlike Q-adverbs, modals are not restricted by the antecedents.

New proposal for modals: associated with three drefs (e.g. $\text{might}^q_{p,r\sqsubseteq q}$)

1. an anaphorically retrieved dref that stores evaluation situations ($p$),
2. a newly established restrictor dref ($q$),
3. a newly established nuclear-scope dref ($r$);

and express a set relation between $q$ and $r$.

E.g. $\phi \text{ might}^q_{p,r\sqsubseteq q} \leadsto \max^q([R^{epi}\{p, q\}]); \max^{r\sqsubseteq q}(\Phi_r); [\text{SOME}\{q, r\}]$
Modal conditionals: Basic implementation (modals in conditionals)

Mary-ga M-nom ku-reba q, come-reba John-mo J-nom ku-ru come-npst kamoshirenai, s ⊑ r.

‘If Mary comes, John might also come.’

\[\begin{align*}
\text{max} q (m\text{-come}) & \rightarrow \text{max} r (R\text{epi}\{q, r\}) \\
\text{max} s \subseteq r (j\text{-come}) & \rightarrow \text{max} q (m\text{-come})
\end{align*}\]
Modal conditionals: Basic implementation (modals in conditionals)

(25)  \( \text{Mary-} \text{a ku-} \text{reba}^q, \text{John-} \text{mo ku-ru} \quad \text{kamoshirenai}^r, \text{s} \sqsubseteq \text{r}. \)

\( \text{M-nom} \quad \text{come-} \text{reba} \quad \text{J-nom} \quad \text{come-} \text{npst} \quad \text{might} \)

‘If Mary comes, John might also come.’
(25)  \( \text{Mary-ga ku-reba}^q, \text{John-mo ku-ru} \quad \text{kamoshirenai}^{r,s \sqsubseteq r}. \)
\[\text{M-nom come-reba J-nom come-npst might} \]
\[\text{‘If Mary comes, John might also come.’} \]

(25) \( \sim \quad \text{max}^q([\text{m-come}_q]); \text{max}^r([\text{Repi} \{q, r\}]); \text{max}^{s \sqsubseteq r}([\text{j-come}_s]); [\text{SOME}\{r, s\}] \)
Mary-ga ku-reba\textsuperscript{q}, John-mo ku-ru kamoshirenai\textsuperscript{r,s}\textsubscript{q}. ‘If Mary comes, John might also come.’

(25) \[ \max^q([m\text{-}come_q]); \max^r([R^{epi}\{q, r\}]); \max^{s\subseteq r}([j\text{-}come_s]); [SOME\{r, s\}] \]
Modal conditionals: Basic implementation (modals in conditionals)

(25) \[\text{Mary-ga ku-reba}^q, \text{John-mo ku-ru kamoshirenai}^{r,s} \subseteq r.\]
\[
\begin{align*}
\text{M-nom} & \text{ come-reba J-nom come-npst might} \\
& \text{ ‘If Mary comes, John might also come.’ }
\end{align*}
\]

(25) \[\leadsto \max^q([m\text{-come}_q]); \max^r([R^{\text{epi}}\{q, r\}])); \max^{s\subseteq r}([j\text{-come}_s]); [\text{SOME}\{r, s\}]
\]

\[
\begin{array}{c|c}
q & r \\
\hline
w_1 & w_1 \\
\hline
w_1 & w_3 \\
\hline
w_2 & w_1 \\
\hline
w_2 & w_3
\end{array}
\]

\[
\begin{array}{c|c}
q & r \\
\hline
w_1 & w_1 \\
\hline
w_1 & w_3 \\
\hline
w_2 & w_1 \\
\hline
w_2 & w_3
\end{array}
\]

\[
\begin{array}{c|c}
q & r \\
\hline
w_1 & w_1 \\
\hline
w_1 & w_3 \\
\hline
w_2 & w_1 \\
\hline
w_2 & w_3
\end{array}
\]
Modal conditionals: Basic implementation (modals in conditionals)

(25) Mary-ga ku-reba\textsuperscript{q}, John-mo ku-ru kamoshirenai\textsuperscript{q,s}\subseteq r.
M-nom come-reba J-nom come-npst might
‘If Mary comes, John might also come.’

(25) \rightsquigarrow \text{max}\textsuperscript{q}([m-come\textsubscript{q}]); \text{max}\textsuperscript{r}([R\textsuperscript{epi}\{q, r\}]); \text{max}\textsuperscript{s}\subseteq r([j-come\textsubscript{s}]); [SOME\{r, s\}]

\[
\begin{array}{c|c}
q & r \\
\hline
W_1 & W_1 \\
W_1 & W_3 \\
W_2 & W_1 \\
W_2 & W_3 \\
\end{array}
\]

\[
\begin{array}{c|c|c}
q & r & s \\
\hline
W_1 & W_1 & W_1 \\
W_1 & W_3 & * \\
W_2 & W_1 & W_1 \\
W_2 & W_3 & * \\
\end{array}
\]
Modal conditionals: Basic implementation (modals in conditionals)

M-nom come-reba J-nom come-npst might  
‘If Mary comes, John might also come.’

(25) \[ \max^q([m\text{-}come_q]) \circ \max^r(\mathbb{R}^{epi}\{q, r\}) \circ \max^s \preceq^r([j\text{-}come_s]) \circ [\text{SOME}\{r, s\}] \]
Modal conditionals: Explaining acceptability of *moshi*
Modal conditionals: Explaining acceptability of *moshi*

(26)  

\[
\text{moshi}^p \text{ Mary-ga } \text{ku-reba}_q^p, \text{John-mo } \text{ku-ru} \quad \text{kamoshirenai}_q^r, s^r.
\]

\text{moshi} \text{ M-nom come-reba J-nom come-npst might}

‘If Mary comes, John might also come.’
Modal conditionals: Explaining acceptability of *moshi*

(26)  

\[
\text{moshi}^p \quad \text{Mary-}ga \quad \text{ku-reba}^q_{\geq p} \quad \text{John-mo} \quad \text{ku-ru} \quad \text{kamoshirenai}^r_{q, s \leq r}.
\]

moshi M-nom come-reba J-nom come-npst might

‘If Mary comes, John might also come.’

\[\sim[p|\text{sing}(p)]; \max^q_{\geq p}([m-\text{come}_q]); \max^r([\text{Repi}\{q, r\}]); \max^s_{\leq r}([j-\text{come}_s]); [\text{SOME}\{r, s\}]\]
 Modal conditionals: Explaining acceptability of *moshi*

(26)  \[ \text{moshi}^p \text{ Mary-ga } \text{ku-reba}_p^q \subseteq^p, \text{John-mo } \text{ku-ru} \text{ kamoshirenai}_q^r, s \sqsubseteq^r. \]

moshi M-nom come-reba J-nom come-npst might

‘If Mary comes, John might also come.’

\[ \sim [p \mid \text{sing}(p)]; \max^q \subseteq^p ([\text{m-come}_q]); \max^r ([\text{Repi}\{q, r\}]); \max^s \subseteq^r ([\text{j-come}_s]); [\text{SOME}\{r, s\}] \]

*Moshi does not* prevent the antecedent from providing a meaningful restrictor for modals:
Modal conditionals: Explaining acceptability of *moshi*

(26)  

\[ \text{moshi}_p^p \text{ Mary-ga ku-reba}_q^q \subseteq p, \text{ John-mo ku-ru } \text{ kamoshirenai}_q^r, s \subseteq r. \]

moshi M-nom come-reba J-nom come-npst might

‘If Mary comes, John might also come.’

\[
\sim [p | \text{sing}(p)]; \max q \subseteq p ([m-\text{come}_q]); \max r ([\text{Repi} \{q, r\}]); \max s \subseteq r ([j-\text{come}_s]); [\text{SOME} \{r, s\}]
\]

*Moshi* does **not** prevent the antecedent from providing a meaningful restrictor for modals:

\[
\begin{array}{c}
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\xrightarrow{[p | \text{sing}(p)]}
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\]

\[
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\xrightarrow{\max q \subseteq p ([m-\text{come}_q])}
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\]

\[
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\xrightarrow{\max q \subseteq p ([m-\text{come}_q])}
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\]

\[
\begin{array}{c}
p \\
\text{w}_1 \\
p \\
\text{w}_2 \\
\vdots
\end{array}
\]
Modal conditionals: Explaining acceptability of *moshi*

(26) \( \text{moshi}^p \text{ Mary-ga ku-reba}^q \sqsubseteq^p \text{, John-mo ku-ru} \text{ kamoshirenai}^r, s \sqsubseteq^r. \)

moshi M-nom come-reba J-nom come-npst might
‘If Mary comes, John might also come.’

\( \sim [p | \text{sing}(p)]; \max^q \sqsubseteq^p ([m-\text{come}_q]); \max^r ([\text{Repi}\{q, r\}]); \max^s \sqsubseteq^r ([j-\text{come}_s]); [\text{SOME}\{r, s\}] \)

*Moshi* does **not** prevent the antecedent from providing a meaningful restrictor for modals:

\[
\begin{array}{c|c|c|c}
 & p & q & r \\
\hline
w_1 & w_1 & w_1 & w_1 \\
\hline
w_2 & w_2 & w_3 & w_3
\end{array}
\]
Modal conditionals: Explaining acceptability of *moshi*

\[(26)\]  
\[\text{moshi}_p \text{ Mary-ga ku-\textit{reba}}_p^{q \sqsubseteq p}, \text{ John-mo ku-\textit{ru}} \quad \text{kamoshirenai}_q^{r, s \sqsubseteq r}.
\]

Moshiba M-nom come-reba J-nom come-npst might  
‘If Mary comes, John might also come.’

\[\sim [p|\text{\textit{sing}}(p)]; \text{max}^{q \sqsubseteq p}([m-\text{come}_q]); \text{max}^r([\text{Repi}\{q, r\}]); \text{max}^s^{r}([j-\text{come}_s]); [\text{SOME}\{r, s\}]]\]

*Moshi* does not prevent the antecedent from providing a meaningful restrictor for modals:

\[
\begin{array}{c}
p \\
\text{w}_1 \\
\vdots \\
\text{w}_2 \\
\end{array} \quad \xrightarrow{[p|\text{\textit{sing}}(p)]} \quad \begin{array}{c}
p \quad \text{max}^{q \sqsubseteq p}([m-\text{come}_q]) \\
\text{w}_1 \quad \text{w}_1 \\
\end{array} \quad \xrightarrow{\text{max}^{q \sqsubseteq p}([m-\text{come}_q])} \quad \begin{array}{c}
p \quad p \\
\text{w}_2 \quad \text{w}_2 \\
\end{array} \quad \xrightarrow{\text{max}^r([\text{Repi}\{q, r\}])} \quad \begin{array}{c}
p \quad p \\
\text{w}_2 \quad \text{w}_2 \\
\end{array} \quad \xrightarrow{\text{max}^r([\text{Repi}\{q, r\}])} \quad \begin{array}{c}
p \quad p \quad r \\
\text{w}_2 \quad \text{w}_2 \quad \text{w}_3 \\
\end{array}
\]

\[
\begin{array}{c}
p \quad q \quad r \quad s \\
\text{w}_1 \quad \text{w}_1 \quad \text{w}_1 \quad \text{*} \\
\text{w}_1 \quad \text{w}_1 \quad \text{w}_3 \quad \text{*} \\
\end{array} \quad \xrightarrow{\text{max}^s^{r}([j-\text{come}_s])} \quad \begin{array}{c}
p \quad q \quad r \quad s \\
\text{w}_2 \quad \text{w}_2 \quad \text{w}_1 \quad \text{w}_1 \\
\text{w}_2 \quad \text{w}_2 \quad \text{w}_3 \quad \text{*} \\
\end{array} \quad \xrightarrow{\text{max}^s^{r}([j-\text{come}_s])} \quad \begin{array}{c}
p \quad q \quad r \quad s \\
\text{w}_2 \quad \text{w}_2 \quad \text{w}_1 \quad \text{w}_1 \\
\text{w}_2 \quad \text{w}_2 \quad \text{w}_3 \quad \text{*} \\
\end{array}
\]
Modal conditionals: Explaining acceptability of *moshi*

(26)  
*moshi*$_p$  Mary-ga ku-*reba*$_p$$_q$$_p$, John-mo ku-*ru*  kamoshirenai$_q$$_r$,$_s$$r$.

moshi  M-nom  come-*reba*  J-nom  come-npst  might

‘If Mary comes, John might also come.’

$\sim [p | \text{sing}(p)]; \text{max}^q_{\subseteq p}([m-\text{come}_q]); \text{max}^r([\text{Re}^\pi\{q, r\}]); \text{max}^s_{\subseteq r}([j-\text{come}_s]); [\text{SOME}\{r, s\}]$

*Moshi* does not prevent the antecedent from providing a meaningful restrictor for modals:

![Diagram](image-url)
Modal conditionals: Explaining acceptability of *moshi*

\[
(26) \quad \text{moshi}^p \text{ Mary-ga ku-reba}^p_{\text{q} \sqsubseteq \text{p}}, \text{ John-mo ku-ru kamoshirenai}^r_{\text{q}, \text{s} \sqsubseteq \text{r}}.
\]

\[
\text{moshi M-nom come-reba J-nom come-npst might 'If Mary comes, John might also come.'}
\]

\[
\sim[p|\text{sing}(p)]; \text{max}^q_{\sqsubseteq \text{p}}([\text{m-come}_q]); \text{max}^r([\text{Repi} \{q, r\}]); \text{max}^s_{\sqsubseteq \text{r}}([\text{j-come}_s]); [\text{SOME}\{r, s\}]
\]

*Moshi does not* prevent the antecedent from providing a meaningful restrictor for modals:

![Diagram of modal conditionals](attachment:modal_conditionals.png)
1. Introduction

2. Data

3. Independent assumption: Q-adverbial vs. modal quantification

4. Analysis

5. Summary
We observed a cut between Q-adverbial and modal conditionals in Japanese in terms of the distribution of *moshi*;
We observed a cut between Q-adverbial and modal conditionals in Japanese in terms of the distribution of *moshi*.

The cut challenged the common assumption of the referential analysis that conditional antecedents introduce plural drefs;
We observed a cut between **Q-adverbial and modal conditionals** in Japanese in terms of the distribution of *moshi*;

The cut challenged the common assumption of the referential analysis that conditional antecedents introduce plural drefs;

We explained the data based on
We observed a cut between **Q-adverbial and modal conditionals** in Japanese in terms of the distribution of *moshi*;

The cut challenged the common assumption of the referential analysis that conditional antecedents introduce plural drefs;

We explained the data based on
- the independent assumption that unlike Q-adverbs, **modals are not restricted by conditional antecedents**; and
We observed a cut between **Q-adverbial and modal conditionals** in Japanese in terms of the distribution of *moshi*;

The cut challenged the common assumption of the referential analysis that conditional antecedents introduce plural drefs;

We explained the data based on
- the independent assumption that unlike Q-adverbs, **modals are not restricted by conditional antecedents**; and
- a referential analysis of conditionals with **overt singularity marking** of situation-type drefs, i.e. by *moshi*. 
Thanks! Questions?

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6. Appendix A: Two types of Q-adverbs and interactions with moshi

7. Appendix B: Potential type-flexibility of moshi
Not all Q-adverbs have to be restricted by conditional antecedents (cf. Geurts 2004 for English):

- **often-type**: *yoku* ‘often’, *tokidoki* ‘sometimes’; can take narrow scope and yield modal readings.

(27) \( \text{hikouki-ni nor-eba, \{yoku / tokidoki\} kibun-ga waruku naru.} \)

plane-dat get.on-reba often sometimes feeling-nom bad become
‘If I’m on a plane, I often/sometimes feel sick.’

a. Q-adverbial: Many/Some situations where I’m on a plane are situations where I feel sick.

b. Modal: In case I get on a plane, I’ll feel sick many times/on and off during that flight.

- **usually-type**: *itsumo* ‘always’, *taitei* ‘usually’; can’t take narrow scope.

(28) \( \text{hikouki-ni nor-eba, \{itsumo / taitei\} kibun-ga waruku naru.} \)

plane-dat get.on-reba always usually feeling-nom bad become
‘If I’m on a plane, I always/usually feel sick.’

a. Q-adverbial: All/Most situations where I’m on a plane are situations where I feel sick.

b. \( \text{x} \) Modal: In case I’m on a plane, I’ll feel sick the whole time/many times during that flight.
**Often-type + moshi:** modal reading only.

(29) *moshi* hikouki-ni nor-eba, {yoku / tokidoki} kibun-ga waruku naru.
moshi plane-dat get.on-reba often sometimes feeling-nom bad become
‘If I’m on a plane, I often/sometimes feel sick.’

a. **X** Q-adv: Many/Some situations where I’m on a plane are
situations where I feel sick.

b. Modal: In case I get on a plane, I’ll feel sick
many times/on and off during that flight.

**Usually-type + moshi:** sentences are odd.

(30) ??*moshi* hikouki-ni nor-eba, {itsumo / taitei} kibun-ga waruku naru.
moshi plane-dat get.on-reba always usually feeling-nom bad become
‘If I’m on a plane, I always/usually feel sick.’

These data further confirm the observation that *moshi* prevents the antecedent from restricting Q-adverbs.
6. Appendix A: Two types of Q-adverbs and interactions with *moshi*

7. Appendix B: Potential type-flexibility of *moshi*
An alternative hypothesis: *Moshi* lexically selects the antecedents that refer to situations; antecedents of modal conditionals refer to worlds, and are thus incompatible with the lexical restriction of *moshi*.

Preliminary evidence against this hypothesis: *Moshi* shows type-flexibility.

Yang (t.a.) shows that *moshi* is allowed in -wa-marked topics:

(31)  
moshi tameshi-ta koto nai kata-wa taiken shi-ta hou-ga ii  
moshi try-pst thing neg people-top try do-pst way-nom good  
des-u yo!  
cop.pol-npst sfp  
lit. ‘People who haven’t tried are such that they should try it.’  
(Roughly:) ‘If one hasn’t tried it, one should try it.’ (Web ex.)

Crucially, in both conditionals and topics, *moshi* exhibits the requirement that the extension of the constituent modified by (antecedent clauses, topical NPs) vary across the context set.
E.g. Bad in factual conditionals:  

(32) A: ‘I received my bonus yesterday.’
B: (moshi) kinou kin’ippuu-ga de-ta nara, ashita kaimono-ni ik-ou.
moshi yesterday bonus-nom release-pst cond tomorrow shopping-dat go-vol
‘If you received your bonus yesterday, let’s go shopping tomorrow.’

E.g. Bad if the speaker knows which individuals satisfy the property expressed by the topic and which individuals don’t:

(33) a. Teacher: ‘Who wants to read newspapers?’
b. (Those who want newspapers raise their hands, those who do not want newspapers do not raise their hands.)
c. Teacher: (moshi) shinbun-o yomi-tai hito-wa, koko-ni aru yo.
moshi newspaper read-want people-top here-dat be sfp
lit. ‘People who want to read newspapers, they are here.’

Yang’s analysis: Moshi exhibits a requirement of speaker uncertainty that is type-flexible between worlds and individuals.

But it still remains unclear whether moshi is type-flexible between situation and worlds. Suggestions for diagnostics are welcome!
References I


References II


