Only 'only' only: a distributed meaning approach to exclusive doubling

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Doubling of exclusive particles

- Co-occurrence of two exclusive particles with the **same focus association**
  - Attested in a number of languages: Dutch, German, Japanese, Korean, Mandarin Chinese, Vietnamese, Yoruba... (see Appendix A)

(1) a. Mary **only** read ONE$_F$ book. (Advberbial/sentential)

b. Mary read **only** ONE$_F$ book. (Adfocal/constituent)

c. # Mary **only** read **only** ONE$_F$ book.

(2) Doubling of exclusive adverbial and adfocal particles in Vietnamese

Nam [**chỉ** [mua [**mỗi** cuốn$_F$ sách]]]. (Single-'only'/"concord" reading)

Nam only buy only one book.

'Nam only bought one book.' (Quek and Hirsch 2017, ex. 23)

(NOT multiple-'only': 'what Nam only did was to buy only one book')

- Apparently only one exclusive particle is interpreted

➜ **Compositionality problems** if both particles are exclusives

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The operator-particle approach

- The prevailing **operator-particle** approach proposes that (S. Bayer 1996; J. Bayer 2020; Y. Lee 2005; Barbiers 2014; Quek and Hirsch 2017; Sun 2021; Branan and Erlewine 2023; *i.a.*):
  - Adfocal particles are *semantically vacuous* concord markers,
  - which establish a *syntactic dependency* with an exclusive operator (either null or realized as the adverbial particles)

(3) $[_{TP}$ Subj $[$**OP-EXCL** $[_{vP}$ V $[$**Prt-only** $[_{DP}$ Focused element$]]]]]$

- However, most cases focus on **quantificational** uses, but it's well-known that exclusives may also have a **scalar** use (Klinedinst 2004, 2005; Beaver and Clark 2008; Coppock and Beaver 2014; Alxatib 2020)
  - The prejacent is ranked lower than some other alternative(s) on a given scale

(4) a. Mary **only** invited ALEX_F. (Quantificational) (Klinedinst 2004, ex.1)

b. Bill is **only** a JUNIOR_F/#SENIOR. (Scalar) (Klinedinst 2004, ex.14)

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Exclusive SFP doubling in Cantonese

- Adverbial ***zinghai*** & sentence-final particle ***zaa3*** (A. Law 2004; P. P.-I. Lee 2019)

(5) Doubling of exclusive adverbial particles and SFPs in Cantonese

Context: Yesterday's party, there were vodka, wine, and beer.

[Aaming **zinghai** jam-zo bezau$_F$] **zaa3** (doubling)

Ming only buy-PERF beer SFP.only

'Ming only drank *beer* (so weak!).' (doubled + scalar reading)

NOT: 'The only thing happened was that M only drank *beer* (multi-'only')

#1 Empirically, a type of exclusive doubling that is understudied (vs. the more-studied adfocal doubling)

#2 SFP *zaa3* is **not** semantically vacuous, but it contributes meaning to the **not-at-issue** (NAI) dimension, which has not be adequately addressed in the Op-Prt approach (but see Hole 2015, 2017; Bajaj 2016)

- Such NAI meaning is **scalar**, and
- **Dependent** on the exclusive focus, as will be shown

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Overview of the talk

- I propose that exclusive doubling does not involve form-meaning mismatches, nor is a pure Op-Prt "concord" phenomenon
- Exclusive doubling instantiates scalar focus structure where *zinghai* encodes **exclusivity** and *zaa3* encodes **scalarity**
- I further propose that *zaa3* does not associate with the focus directly. Instead, always targets the very **same alternative set** quantified by *zinghai*
  ➜ *zaa3* is **dependent** on *zinghai*

(6) Exclusive SFPs realize scalar focus structures in Cantonese

[***zaa3***$_{\text{[Scalarity]}}$ … [***zinghai***$_{\text{[Exclusivity]}}$ … XP_{F} …]]

- I propose to capture the dependency by **co-indexing** Roothian C
  ➜ there are multiple ways for **higher operators to access alternatives**, in addition to the existing $\sim_{\text{pass}}$ mechanism (e.g. Bade and Sachs 2019)

A note on the syntactic position

- The SFP *zaa3* is high in the CP layer (A. Law 2004; Tang 2015; P. Law 2021)
- *Zinghai* is an adverb that may attach to positions in-between CP and VP

(7) SFP doubling

[$\textbf{SFP}_{\textbf{excl}}$=*zaa3* ... [$\textbf{Adv}_{\textbf{excl}}$=*zinghai* ... [XP_F ...]]]

- For expository purposes, I represent *zaa3* in the left periphery, and remain neutral to its head-directionality (see Simpson and Wu 2002; Paul 2014; Erlewine 2017b; Pan 2022 for how the sentence-final order is derived)

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a. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan. (adverbial)
Ming only buy-PERF lamb to Fan

b. Aaming maai-zo joengjuk$_F$ bei Aafan **zaa3** (SFP)
Ming buy-PERF lamb to Fan SFP.only

c. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan **zaa3** (doubling)
Ming only buy-PERF lamb to Fan SFP.only
(a-c): 'Ming only bought Fan *lamb* (but not beef or pork).'

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- Can also be *negated*, *questioned*, or take *narrow scope under epistemic modals* (See Appendix B)

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Truth of the prejacent

- Besides exclusiveness, *zinghai* and/or *zaa3* also subsume the truth of the prejacent (See Appendix B)

(9) Ming only bought Fan *lamb*
⇝ Ming bought Fan lamb

- The nature of this inference is subject to debate
  - being a presupposition (Horn 1969; Alonso-Ovalle and Hirsch 2022), some presupposition in other forms (e.g., existential in Horn 1996; von Fintel and Iatridou 2007, scalar in Beaver and Clark 2008, conditional in Ippolito 2008), an implicature (McCawley 1981), or even a non-assertoric entailment (Horn 2002), among others.
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The source of exclusiveness

- On the one hand: The presence of either *zinghai* or *zaa3* yields at-issue exclusiveness ➜ both are exclusive operators
- On the other hand: The truth conditions remain unchanged in the doubling case ➜ only one can be the exclusive operator ➜ **but which one?**

(10) Three logical possibilities in the doubling cases

a. ***Zinghai* is the operator**

b. *Zaa3* is the operator

c. Neither is the operator - there is a null operator

➜ A test with (attempted) multiple focus associations

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Dependent focus association

- First, SFP *zaa3* may associate with subjects (A. Law 2004; Cheng 2015)

(11) AAMING$_{F}$ taai zungmansyu **zaa3** (, #Aafan dou hai.)
Ming read Chinese.book SFP.only Fan also be
'Only *Ming* reads Chinese books. (# Fan as well.)'

- Second, *zinghai* fails to associate with subjects outside of its scope/c-commanding domain (*cf.* English *only*, Jackendoff 1972; Erlewine 2014, *i.a.*)
- Association with subjects is only possible when *zinghai* is pre-subject

(12) a. AAMING$_{\{*F1\}}$ **zinghai** taai zungmansyu$_{\{F2\}}$ (, Aafan dou hai.)
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Dependent focus association (cont.)

- In **multiple-focus** cases, however, *zaa3* **fails** to associate with the subject, which is outside *zinghai*'s scope
- No multiple 'only' reading like English *only*

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M only reads Chinese books. (F also only reads Chinese books.)
BUT NOT: 'Only M only reads Chinese books. (F reads both Chinese books and English books.)'

➜ *Zaa3*'s focus association is **dependent/"parasitic"** on *zinghai*

(14) a. *[Zaa3 ... **F1** [zinghai ... F2] b. [Zaa3 ... **F1** [zinghai ... F2]

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b. [Zaa3 ... **F1** [zinghai ... F2]

Dependent focus association (cont.)

- Multiple *zinghai*, though slightly marked, give the multiple 'only' reading

➜ *Zinghai* is the exclusive operator, *zaa3* is not

(15) **Zinghai** (dak) AAMING$_{F1}$ **zinghai** taai zungmansyu$_{F2}$ (, #Aafan
only only.have Ming only read Chinese.book Fan
dou hai zinghai zungmansyu$_{F2}$ syu.)
also be only Chinese book
'Only M only reads Chinese books. (# F also only reads Chinese books.)'

An operator-particle-like dependency

- SFP doubling displays an operator-particle-like dependency

(16) [***zaa3*** ... [**OP**=*zinghai* ... [XP_F ...]]]

- In singleton *zaa3* cases, the dependency is established with a null exclusive operator, EXCL
- I assume that EXCL can only occur when:
  - (i) There is no overt *clausemate* exclusives like *zinghai*
  - (ii) It is required to satisfy the dependency with *zaa3* (to be addressed later)

(17) [***zaa3*** ... [**OP**=EXCL-∅ ... [XP_F ...]]] (singleton *zaa3* cases)

- **However, is *zaa3* truly a semantically vacuous concord marker? Why would languages employ such a "dummy" particle in doubling?**

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Different felicity conditions

- While *zaa3* sentences apparently have the same truth conditions with *zinghai*, their felicity conditions are different
- *Zaa3* has **focus sensitive** contribution on the **not-at-issue** level, and requires some excluded alternatives to be:

#1	Contextually **salient** and/or
#2	**Ranked higher** than the true prejacent on a contextually given scale

#1: Contextual salience

- Salience regulated by purely contextual information
  - *Zaa3*, unlike *zinghai*, can only be used when some alternative (i.e., beef) is highlighted in the context such that both speaker and addressee are aware of it (*cf.* Portner 2007's notion of Common Proposition Space)

(18) Contextual information: (non-)salience

a. *You are a cashier in a meat market in the US. You just served a customer, and your colleague seems to be curious about what they bought. You say:*

b. *Same with (a), except that* ***beef is newly arrived and is really good today****.*

c. Go haak {**zinghai**} maai-zo joengjuk$_F$ {a.#/b.^{OK}**zaa3**}
CL customer only buy-PERF lamb SFP.only
The customer only bought lamb. (#S/he also bought pork.)

- At least one excluded alternative is more salient than the prejacent
- Notice that non-salient yet contextually relevant alternatives (e.g., pork) are still excluded

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- Salience achieved by linguistic antecedent in the discourse
  - *Zaa3* is licensed by a previous assertion and strengthens the "corrective" sense

(19) Previous assertion licenses *zaa*

a. Ming: Ngau sik kwancung.
cow eat insect
Ming: 'Cows eat insect.'

b. You: Ngau {**zinghai**} sik zikmat$_F$ {**zaa3**}.
cow only eat plant SFP.only
Cows only eat plants.

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#2: Scalar meaning

- In contexts where all the alternatives are equally (non-)salient, a scale must be invoked to license *zaa3*
- At least one excluded alternative is ranked higher than the prejacent on a contextually given scale (e.g., ABV)
  <beer, wine, vodka>$_{\text{ABV}}$, where *beer* $<_s$ *wine*/*vodka*

(20) *Yesterday's party: there were vodka, wine, and beer.* (=5)

[Aaming **zinghai** jam-zo bezau$_F$] {**zaa3**} (doubling)

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'Ming only drank *beer* (so weak!).' (doubled + scalar reading)

- Two tests to confirm *zaa3*'s scalar contribution
  - Contexts without a salient scale (e.g., a listing scenario)
  - Superlatives targeting the upper bound of the scale

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(20) *Yesterday's party: there were vodka, wine, and beer.* (=5)

[Aaming **zinghai** jam-zo bezau$_F$] $\boxed{\{\textbf{zaa3}\}}$ (doubling)

Ming only buy-PERF beer SFP.only

'Ming only drank *beer* (so weak!).' (doubled + scalar reading)

- Two tests to confirm *zaa3*'s scalar contribution
  - Contexts without a salient scale (e.g., a listing scenario)
  - Superlatives targeting the upper bound of the scale

#2: Scalar meaning (cont.)

- *Zaa3* is banned in contexts without a salient scale (e.g., a listing scenario)
  - All the alternatives are equally salient due to listing: *beer* = *wine* = *vodka*
  - No scale (e.g., ABV) is invoked

(21) A listing scenario that lacks a salient scale

At a liquor store, you are reporting the type of alcohol each customer bought to your boss.

A {**zinghai**} maai-zo bezau$_F$ {#**zaa3**}, B {**zinghai**} maai-zo hongzau
A only buy-PFV beer SFP.only B only buy-PFV red.wine
{#**zaa3**}, C {**zinghai**} maai-zo fokdakga {#**zaa3**}, ...
SFP.only C only buy-PFV vodka SFP.only

'A only bought beer, B only bought (red) wine, C only bought vodka, ...'

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'A only bought beer, B only bought (red) wine, C only bought vodka, ...'

#2: Scalar meaning (cont.)

- *Zaa3* is banned when associating with the upper bound of a scale
  - A context facilitating a scale of difficulty to evaluate student performance
  - <easiest PS, ..., hardest PS>$_{\text{difficulty}}$

(22) Superlatives targeting the **upper/lower bound** of the scale

Context: You ask a teacher who is the best/worst student. The teacher answered: Ming is the best/worst student, because ...

a. Keoi {**zinghai**} zou [zeoi naan]$_F$ ge taimuk {**#zaa3**}. (Upper)
   3SG only do most hard GE question SFP.only
   He only does *the hardest* problem set.

b. Keoi {**zinghai**} zou [zeoi jungji]$_F$ ge taimuk {**zaa3**}. (Lower)
   3SG only do most easy GE question SFP.only
   He only does *the easiest* problem set.

- Note: While Beaver and Clark (2008) suggests that scalar *only* cannot associate with the "bottom" element on a scale, Alxatib (2020, p.46-47) shows it is indeed possible

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Projection of the salience/scalar component

- The salience/scalar requirement by *zaa3* is not-at-issue
- Projects through negation, question, epistemic modals, attitude verbs, etc.

(23) [At yesterday's party, there were vodka, wine, and beer.]

a. A: [Aaming **zinghai** jam-zo bezau$_F$] {**zaa4**}? (yes-no question)

Ming only buy-PERF beer SFP.only

'Did Ming only drank *beer* last night? (Was Ming that weak?)'

b. B: No! (Ming didn't only drink beer/# Beer actually has the highest ABV since other alcohols were diluted)

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Exclusive doubling as scalar focus structures

- The leading idea: Exclusive doubling instantiates scalar focus structure where *zinghai* encodes **exclusivity** and *zaa3* encodes **scalarity**

(24) Exclusive SFPs realize scalar focus structures in Cantonese

[***zaa3***$_{[\text{Scalarity}]}$ … [***zinghai***$_{[\text{Exclusivity}]}$ … XP_{F} …]]

➜ No compositionality problems/form-meaning mismatches

➜ **NOT** a pure Op-Prt "concord" phenomenon (where Prt = semantically vacuous)

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Exclusive doubling as scalar focus structures (cont.)

- However, I maintain the core insight in the Op-Prt approach that there is a **dependency** ➜ Not simply "1+1"

(25) ***Zaa3*** is **dependent** on ***zinghai*** in three senses

a. ***zaa3*** requires the presence of ***zinghai*** **/EXCL**

b. ***Zaa3***'s focus association is determined by ***zinghai*** **/EXCL**'s

c. ***Zaa3*** ranks the alternatives excluded by ***zinghai*** **/EXCL**
➜ *zaa3* always targets the very **same alternative set** quantified by *zinghai*

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The Roothian theory of focus

- Rooth (1992) ordinary vs. focus alternative (ALT) values

(26) a. $[\![\alpha_F]\!] = a$

b. $[\![\alpha_F]\!]^{ALT} = \{a, b, c, d, e, f, g, ...\}$

- Focus operators always introduce a $\sim$ (squiggle) that takes the ALT value and a contextual variable C
  - $\sim$ constrains C to be a subset of the ALT value
  - $\sim$ "resets" the ALT value to be a singleton set of the ordinary value

(27) a. $C_i = \{a, b, c\}$

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- Focus operators like 'only' take C instead of the ALT value, before taking the prejacent (a proposition$_{<s,t>}$, after Alonso-Ovalle and Hirsch 2022)

(28) $[\![\text{only}]\!](C_i) = \lambda p \lambda w : p(w). \forall q[(q \in C_i \wedge q(w)) \rightarrow p \subseteq q]$

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Accessing alternatives with multiple focus operators

- In exclusive doubling, both particles associate with the same focus association
  ➜ Both are focus sensitive ***operators***!
- Higher OP cannot access the focus if $\sim$ resets the focus value (cf. Beck 2006)

(29) [OP1(C_j) $\sim_{\text{reset}}$ C_j[... [OP2(C_i) ... $\sim_{\text{reset}}$ C_i [XP_F ...]]]

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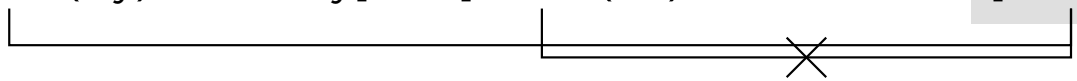

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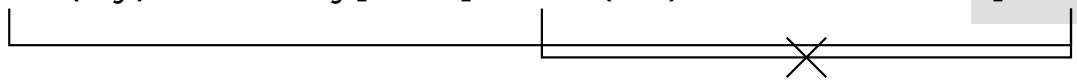

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Accessing alternatives with multiple focus operators (cont.)

- Two possibilities:

#1 Passing up alternatives

- There is a variant of $\sim$ that **passes up the alternatives** (Fox 2007; Wagner 2012; Crni 2013; Bade and Sachs 2019)

➜ motivated by recursive exhaustification for free-choice inferences, etc.

(30) [OP1(C_j) $\sim_{\text{reset}}$ C_j[... [OP2(C_i) ... $\sim_{\text{pass}}$ C_i [XP_F ...]]]

#2 Co-indexation of C ➜ The proposed one

- Instead of introducing another $\sim$ C, the higher focus operator's C is **co-indexed** with the lower one

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A compositional analysis

- I propose that ***zinghai*** is the exclusive operator

(32) The semantics of *zinghai*/EXCL

$[\![\textit{zinghai}/\textsc{excl}]\!](C_i) =$ **AI:** $\lambda p \lambda w. \forall q[(q \in C_i \wedge q(w)) \rightarrow p \subseteq q]$
NAI: $p(w)$

- At-issue (AI): negates all the alternatives in C_i that are not entailed by the prejacent p on the at-issue level
- NAI: presupposes p

A compositional analysis (cont.)

- ***Zaa3*** only operates on the NAI level, that requires **at least one alternative excluded by the lower operator to be ranked higher than the true prejacent** (of the lower operator)

(33) The semantics of *zaa3*

a. $[\![zaa3]\!](C_i) =$ **AI:** $\lambda r \lambda w.r(w)$; where r is an exclusive proposition (see §5)
NAI: $\exists p, q \in C_i[(r \cap q = \varnothing \wedge r \cap p \neq \varnothing) \rightarrow p <_s q]$

- AI: a (partial) identity function that takes r and returns r
- NAI: there exists two alternatives p, q in C_i such that p is compatible with r but q is not, and q is ranked higher than p on a contextually given scale

- Dependency in doubling as co-indexation of C_i

(34) $[_{CP}$ zaa(C_i) $[_{TP}$ zinghai(C_i) $[\sim C_i$ $_{vP}$ Ming $[_{v'}$ buy $[_{DP}$ lamb$_F$ $]]]]]$

- Co-indexation potentially as a result of syntactic Agree relation between *zinghai* and *zaa3* (see Yip 2023) (*cf.* binding as Agree, Reuland 2001; Kratzer 2009, *i.a.*)

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A compositional analysis (cont.)

- An example with contextual salience
- $C_i = \{^\wedge$Ming buy pork, $^\wedge$Ming buy lamb, $^\wedge$Ming buy beef$\}$
  where [$^\wedge$Ming buy lamb] $<_{\text{salience}}$ [$^\wedge$Ming buy beef]

(35) Contextual information: (non-)salience

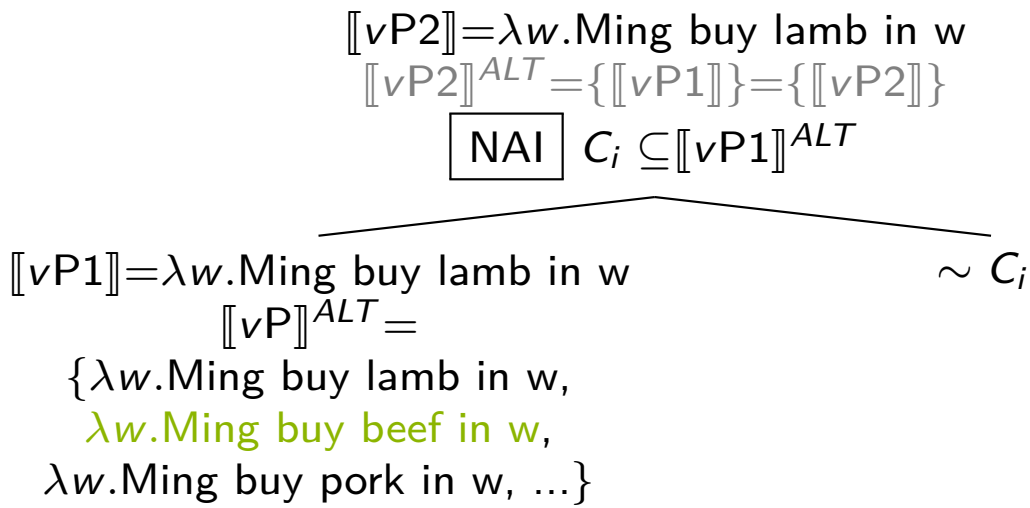
You are a cashier in a meat market in the US. ***Beef is newly arrived and is really good today****. You just served Ming, and your colleague asks you what he bought.*

Aaming	**zinghai**	maai-zo	joengjuk$_F$	**zaa3**
Ming	only	buy-PERF	lamb	SFP.only

Ming only bought lamb.

A compositional analysis (cont.)

(36) The composition of (35)



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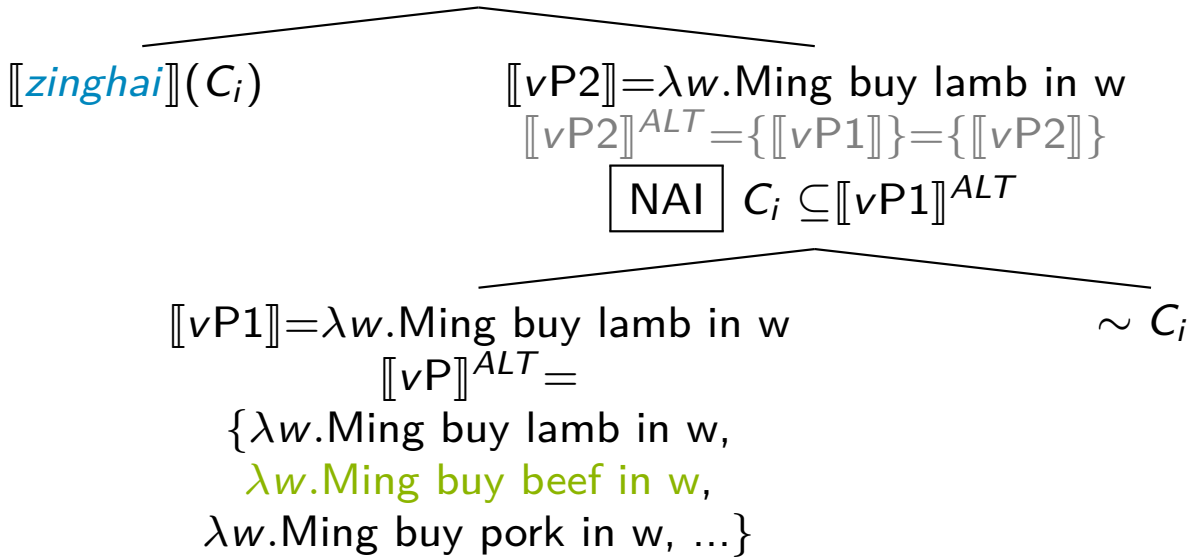

A compositional analysis (cont.)

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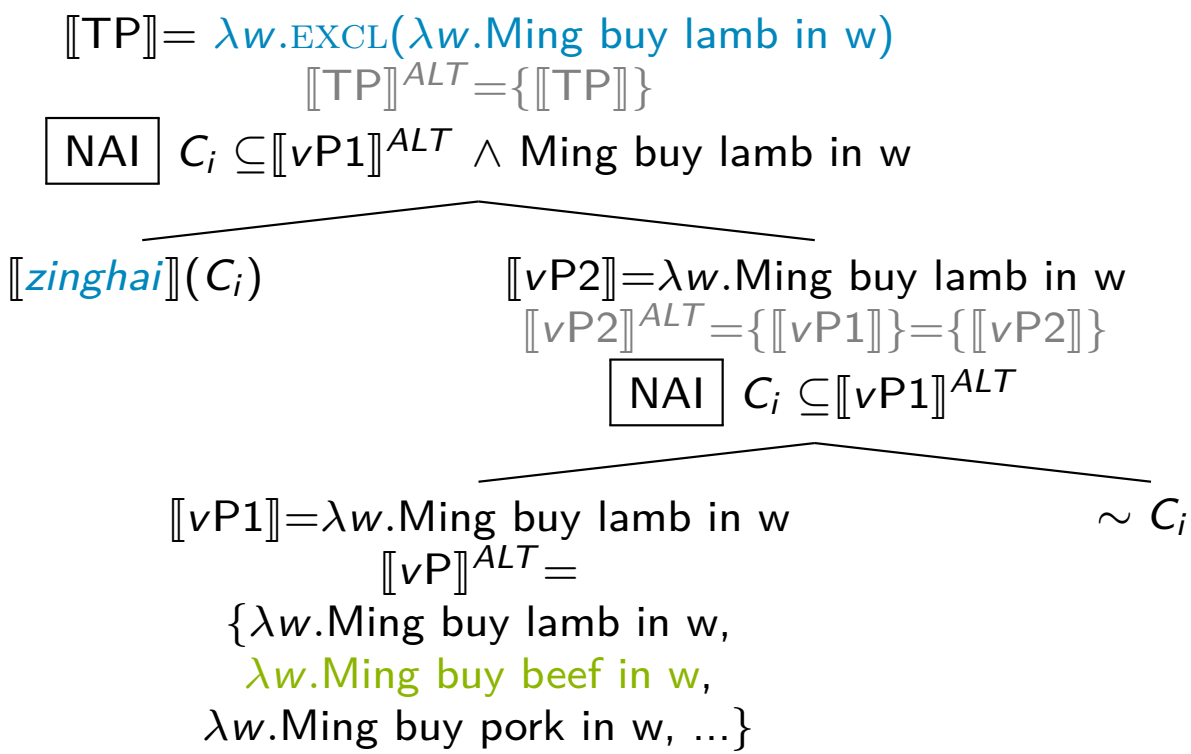

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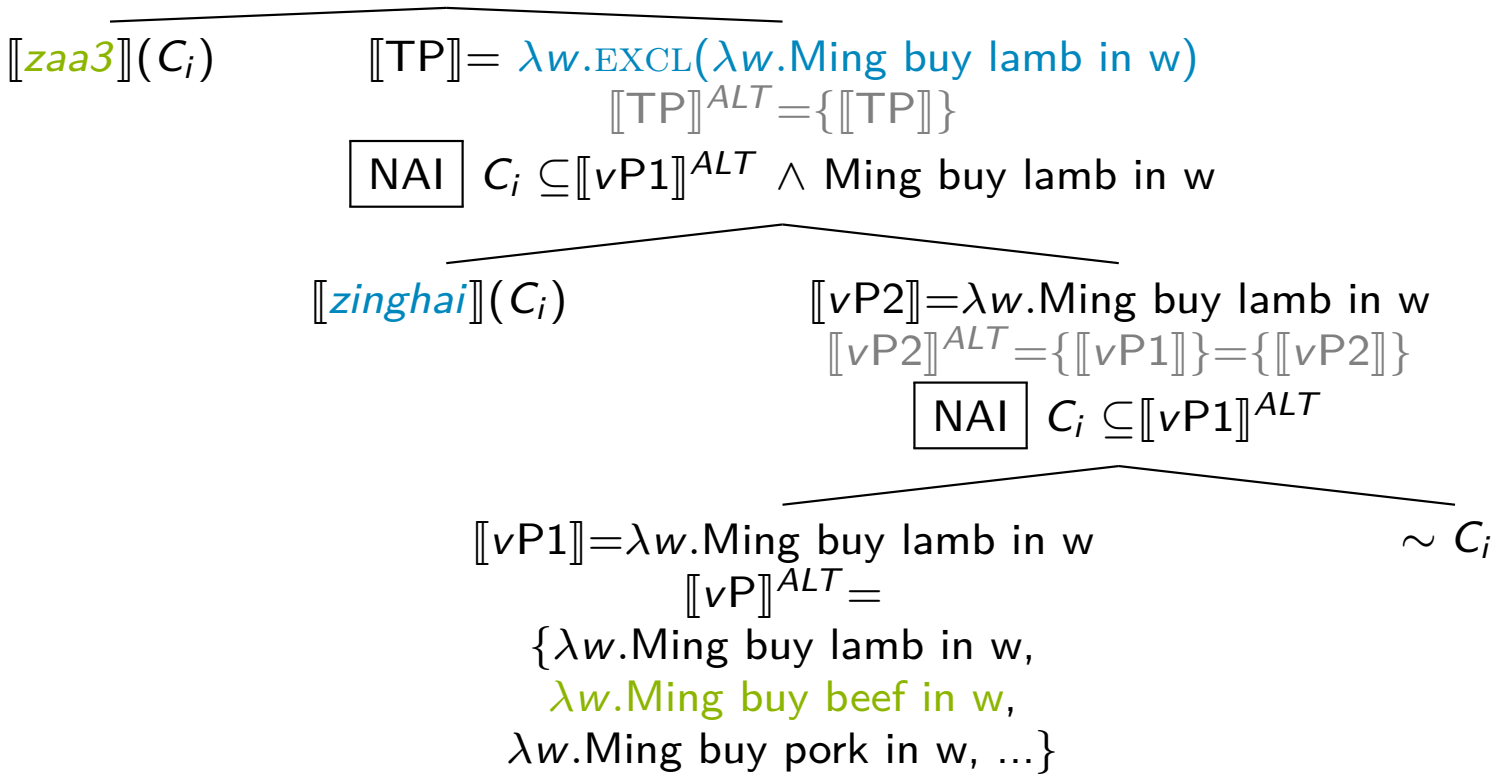

A compositional analysis (cont.)

(36) The composition of (35)

$[\![\text{CP}]\!]=\lambda w.\text{EXCL}(\lambda w.\text{Ming buy lamb in w})$; $[\![\text{CP}]\!]^{ALT}=\{[\![\text{CP}]\!]\}$

NAI $C_i \subseteq [\![\text{vP1}]\!]^{ALT} \wedge$ Ming buy lamb in w $\wedge$
$\exists p, q \in C_i$ [$\lambda w.\text{EXCL}(\lambda w.\text{m buy l in w}) \cap q = \varnothing \wedge$
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$[\![\textit{zaa3}]\!](C_i)$

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$[\![\textit{zinghai}]\!](C_i)$

$[\![\text{vP2}]\!]=\lambda w.$Ming buy lamb in w
$[\![\text{vP2}]\!]^{ALT}=\{[\![\text{vP1}]\!]\}=\{[\![\text{vP2}]\!]\}$

NAI $C_i \subseteq [\![\text{vP1}]\!]^{ALT}$

$[\![\text{vP1}]\!]=\lambda w.$Ming buy lamb in w
$[\![\text{vP}]\!]^{ALT}=$
{$\lambda w.$Ming buy lamb in w,
$\lambda w.$Ming buy beef in w,
$\lambda w.$Ming buy pork in w, ...}

$\sim C_i$

Not passing up alternatives

- Passing up the alternatives means that the lower operator is included in the alternative set as well, forming a pre-exhaustified set

(37) $[_{CP}$ zaa3(C_j) $[_{TP2}$ $\sim_{reset} C_j$ **$[_{TP1}$** zinghai(C_i) $[$ $\sim_{pass} C_i$ $[$ M buy lamb$_F$ **]]]]**

- However, it would predict a meaning that is too strong!
  ➜ *zaa3* now ranks the alternative exclusive propositions

(38) a. $[\![\text{TP1}]\!] = \lambda w.\text{EXCL}(\lambda w.\text{Ming buy lamb in w})$

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c. The required ordering by *zaa3*:
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Not passing up alternatives (cont.)

- A non-exclusive proposition in the discourse is enough to license *zaa3*

(39) Salient **non**-exclusive propositions in the discourse

a. A: {Ming bought beef./ Ming only bought beef.}

b. B: M-hai. Aaming {**zinghai**} maai-zo joengjuk$_F$ {**zaa3**}.
no Ming only buy-PFV lamb SFP.only
No. Ming only bought *lamb*.

Not passing up alternatives (cont.)

- One might say there is a covert 'only'/EXCL in plain assertion
- However, a preceding assertion like 'Ming bought all the meat' can also license *zaa3* in the next sentence.

(40) a. A: Ming bought **all** the meat (in the store).

b. B: M-hai. Aaming {**zinghai**} maai-zo joengjuk$_F$ {**zaa3**}.
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'No. Ming only bought *lamb*.'

- *Zinghai* 'only' cannot associate with universal quantifiers due to the ban against its vacuous use (e.g., Alxatib 2020, a.o.)
➜ [λw.EXCL(λw.Ming buy all meat in w)] is ill-formed and cannot be ranked against [λw.EXCL(λw.Ming buy lamb in w)]

(41) *Aaming **zinghai** maai-zo **jyunbou** juk$_F$.
Ming only buy-PFV all meat
'Ming only bought all the meat.'

Not passing up alternatives (cont.)

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The dependency in exclusive doubling

- Now we're able to capture ***zaa3***'s dependency (b-c) by co-indexation of C_i
- But how about (a)? What can't other focus operators license *zaa3*?

(42) a. ***Zaa3*** requires the presence of ***zinghai*/EXCL** ??

b. ***Zaa3***'s focus association is determined by ***zinghai*/EXCL**'s ✔

c. ***Zaa3*** ranks the alternatives excluded by ***zinghai*/EXCL** ✔

#1 Deriving the requirement on exclusiveness **semantically** (=a)

#2 Predicting (non-)intervention on the dependency

The dependency in exclusive doubling

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#1 Deriving the requirement on exclusiveness **semantically** (=a)

#2 Predicting (non-)intervention on the dependency

#1: Deriving requirement on exclusiveness

- Op-Prt approach: *syntactic* requirement (e.g., Quek and Hirsch 2017; Sun 2021)
- I suggest that the **identification of excluded alternatives** of *zaa3* already derives this requirement **semantically**

(43) The semantics of *zaa3*

a. $[\![zaa3]\!](C_i) =$ **AI:** $\lambda r \lambda w.r(w)$
NAI: $\exists p, q \in C_i[(r \cap q = \varnothing \wedge r \cap p \neq \varnothing) \rightarrow p <_s q]$

- r (*zaa3*'s prejacent) must exclude some propositions in C_i (i.e., so there exists q)
- r returned by non-exclusive focus operators cannot satisfy *zaa3*'s semantics

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#1: Deriving requirement on exclusiveness (cont.)

- EVEN asserts the truth of the prejacent and presupposes that the prejacent is the least likely proposition among the alternative set (Horn 1969; Rooth 1985; Erlewine and Kotek 2018, *i.a.*; but see Kay 1990 and many others for (un)expectedness or noteworthiness)

(44) $[\![EVEN]\!](C_i) =$ **AI:** $\lambda r \lambda w.r(w)$
NAI: $\forall q[(q \in C_i \wedge q \not\subseteq p) \rightarrow p <_{likely} q]$

- Crucially, EVEN **does not exclude** the possibility of other alternatives q.

➜ Even if we assume *zaa3*'s C_i is co-indexed with EVEN's C_i, *zaa3* is predicted to be unlicensed.

#1: Deriving requirement on exclusiveness (cont.)

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➜ Even if we assume *zaa3*'s C_i is co-indexed with EVEN's C_i, *zaa3* is predicted to be unlicensed.

#1: Deriving requirement on exclusiveness (cont.)

- As predicted, 'even' does **not** license zaa3.

(45) *Lin* even cannot license *zaa3*

a. *Scenario: Ming went to a market with us to buy rice, and we saw that lobsters are really bad and beef is good today. You left earlier, and ask me what Ming bought other than rice. I say:*

Aaming gingjin **lin** lunghaa$_F$ dou maai-maai (***zaa3**)

Ming unexpectedly even lobsters also buy-ALSO SFP.only

'Ming even bought **lobsters**!'

b. $r = \phi_{m,l}$ ('Ming bought lobsters')
$C_i = \{\phi_{m,l}, \phi_{m,r}, \phi_{m,b}, ...\}$
$\rightsquigarrow \nexists q[q \in C_i \wedge (r \cap q = \varnothing)]$

#2: (Non-)intervention: negation

- The account also predicts that some elements like **negation** cannot intervene between *zinghai* and *zaa3*.

(46) Intervention effects by aspectual negation

a. *Fan said Ming only bought lamb for tonight's dinner. You know that Ming did buy beef as well, so you say: "no, ..."*

... Aaming **mou** **zinghai** maai [joengjuk]$_F$ **(*zaa3)**. (¬ > only)
Ming NEG.PFV only buy lamb SFP.only

Ming didn't only buy lamb. (he bought beef in addition to lamb)

b. *[zaa3 [$_{CP}$ ... [$_{NegP}$ ***mou*** 'NEG.PFV' ... [zinghai ...

#2: (Non-)intervention: negation (cont.)

- The LF structure and the derivation is given below.

(47) [$_{CP}$ zaa3(C_i) [**$_{NegP}$ mou** [$_{vP2}$ zinghai(C_i) [$\sim$ C_i [$_{vP1}$ Ming bought lamb$_F$]]]]]

(48) $[\![mou]\!] = \lambda p \lambda w. \neg p(w)$ (tense/aspect semantics ignored)

(49) The derivation of (47)

a. $[\![vP1]\!] = {}^{\wedge}$Ming buy lamb $= \phi_l$

b. $C_i = \{\phi_l, \phi_b, \phi_p, \ldots\}$

c. $[\![vP2]\!] = \lambda w. \forall q[(q \in C_i \wedge q(w)) \rightarrow \phi_l \subseteq q]$
$= \neg\phi_b \wedge \neg\phi_p \wedge \ldots$ **EXCL $\rightsquigarrow$ conjunction of negated propositions**

d. $[\![NegP]\!] = \lambda w. \neg\forall q[(q \in C_i \wedge q(w)) \rightarrow \phi_l \subseteq q] = \lambda w. \exists q[(q \in C_i \wedge q(w)) \rightarrow \phi_l \not\subseteq q]$
$= \phi_b \vee \phi_p \vee \ldots$ **negating EXCL $\rightsquigarrow$ disjunction**

e. $[\![CP]\!]$ = **undefined**, as there is ***no*** proposition in C_i that is excluded by $[\![NegP]\!]$, i.e., $\neg\exists q[(q \in C_i \wedge r \cap q = \varnothing)]$

- Derivation crashes since the intervening negation "loosens" the truth condition of *zaa3*'s prejacent ➜ negation cannot intervene

#2: (Non-)intervention: negation (cont.)

- The LF structure and the derivation is given below.

(47) [$_{CP}$ zaa3(C_i) [**$_{NegP}$ mou** [$_{vP2}$ zinghai(C_i) [$\sim$ C_i [$_{vP1}$ Ming bought lamb$_F$]]]]]

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- Derivation crashes since the intervening negation "loosens" the truth condition of *zaa3*'s prejacent ➜ negation cannot intervene

#2: (Non-)intervention: focus operators

- The account also predicts focus operators like 'even' 'also' do not trigger intervention effects, since they **do not alter the truth conditions**

(50) 'Even' focus *lin ... dou* associating with subjects

Context: There are three papers assigned for each week for a given course. Ming is the best student who always reads all the assigned papers beforehand. However, this week's reading is difficult and all the students, including Ming, only read one paper.

Lin	Aaming$_{F1}$	dou	[**zinghai**	tai-zo	*jat-bin*	*abstract*$_{F2}$]	**zaa3**.
even	Ming	also	only	read-PFV	one-CL	paper	SFP.only

Even Ming only read one paper.'

#2: (Non-)intervention: focus operators (cont.)

- Recall:

(51) The semantics of *lin...dou*

$[\![EVEN]\!](C_k) =$ **AI:** $\lambda r \lambda w.r(w)$

NAI: $\forall q[(q \in C_k \wedge r \not\subseteq q) \rightarrow r <_{likely} q]$

- EVEN is a partial identity function on the at-issue level
  - ➜ does not alter the truth condition of the exclusive proposition with *zinghai*
  - ➜ *Zaa3*'s prejacent excludes the non-*p* alternatives in C_i
  - ➜ EVEN may intervene
- No focus intervention effects (Beck 2006):
  Zaa3 & zinghai's $C_i \neq$ EVEN's C_k

#2: (Non-)intervention: focus operators (cont.)

- Recall:

(51) The semantics of *lin...dou*

$[\![EVEN]\!](C_k) =$ **AI:** $\lambda r \lambda w.r(w)$

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Conclusion

(52) Exclusive SFPs realize scalar focus structures in Cantonese

[***zaa3***$(C_i)_{[\text{Scalarity}]}$ ... [***zinghai***$(C_i)_{[\text{Exclusivity}]} \sim C_i$ ... XP_F ...]]

- Meaning is distributed: Exclusive doubling in Cantonese instantiates scalar focus structure where *zinghai* encodes **exclusivity** and *zaa3* encodes **scalarity**
  ➜ Not really an **Op-Prt** dependency (but **Op-Op**)
- Dependency in exclusive doubling: *Zaa3* targets the same alternative set quantified by *zinghai* via co-indexation of C_i
  ➜ Still have an Op-Prt-like **dependency**

➜ There are multiple ways for **higher operators to access alternatives**, in addition to the existing $\sim_{\text{pass}}$ mechanism (e.g. Bade and Sachs 2019)

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Further directions

- An attempt to answer "why doubling?"
- Doubling is not "redundant" nor simply a reflex of syntactic dependency, but manifests a structure where meaning pieces are **distributed** yet one is **dependent** on another one
- Cross-linguistic evidence beyond Cantonese:
  similar scalar components found in
  - Mandarin adverbial-SFP doubling
  - German adverbial-adfocal doubling (Hole 2017)
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  - Akan adfocal-adfocal doubling (Comfort Ahenkorah p.c.)
- How about other focus particles like 'even' and 'also'?

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Appendix A: Exclusive doubling cross-linguistically

(53)
a. Akan (C. Ahenkorah p.c.)
b. Bangla (U. Banerjee p.c.)
c. Cantonese (A. Law 2004; P. P.-l. Lee 2019; Yip 2023)
d. Dutch (Barbiers 2014)
e. English (rare cases in J. Bayer 2020), e.g., *the stakes have never been higher as he only has only 48 hours to find someone to take care of his young daughter*
f. Ga (Renans 2017)
g. German (Hole 2015; J. Bayer 2020)
h. German sign language (Herrmann 2013)
i. Hindi (Bajaj 2016)
j. Japanese (Erlewine 2012)
k. Kasem (Aremu 2024)
l. Korean (Y. Lee 2005)
m. Mandarin Chinese (Hole 2017; Sun 2021)
n. Vietnamese (Hole 2013, 2017; Erlewine 2017a)
o. Yoruba (Yip and Adedeji 2024)
p. ...

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Appendix B: At-issue exclusiveness

- The exclusiveness may be **directly dissented**

(54) Doubling of exclusive particles in Cantonese

a. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan. (adverbial)
Ming only buy-PERF lamb to Fan

b. Aaming maai-zo joengjuk$_F$ bei Aafan **zaa3** (SFP)
Ming buy-PERF lamb to Fan SFP.only

c. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan **zaa3** (doubling)
Ming only buy-PERF lamb to Fan SFP.only
(a-c): 'Ming only bought Fan *lamb* (but not beef or pork).'

(55) Can directly challenge the exclusiveness in (54a-c)
B: M-hai. (Aaming zung maai-zo zyujuk bei Aafan.)
no Ming also buy-PERF pork to Fan
'No. (Ming also bought Fan pork.)'

Appendix B: At-issue exclusiveness

- The exclusiveness may be **directly dissented**

(54) Doubling of exclusive particles in Cantonese

a. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan. (adverbial)
Ming only buy-PERF lamb to Fan

b. Aaming maai-zo joengjuk$_F$ bei Aafan **zaa3** (SFP)
Ming buy-PERF lamb to Fan SFP.only

c. Aaming **zinghai** maai-zo joengjuk$_F$ bei Aafan **zaa3** (doubling)
Ming only buy-PERF lamb to Fan SFP.only
(a-c): 'Ming only bought Fan *lamb* (but not beef or pork).'

(55) Can directly challenge the exclusiveness in (54a-c)

B: M-hai. (Aaming zung maai-zo zyujuk bei Aafan.)
no Ming also buy-PERF pork to Fan
'No. (Ming also bought Fan pork.)'

At-issue exclusiveness (cont.)

- The exclusivity **questioned**
- Yes-no question particle *aa4* (high at SAP, Tang 2015; Yip 2022; *cf.* Dayal 2023)

(56) Can be questioned

a. Aaming **zinghai** maai-zo joengjuk$_F$ aa4?
Ming only buy-PERF lamb SFP.Q
'Did Ming only buy lamb?'

b. Aaming maai-zo joengjuk$_F$ **zaa4**?
Ming buy-PERF lamb SFP.only.Q
'Did Ming only buy lamb?'

c. Aaming **zinghai** maai-zo joengjuk$_F$ **zaa4**?
Ming only buy-PERF lamb SFP.only.Q
'Did Ming only buy lamb?'

Truth of the prejacent

- *Zinghai* & *zaa3* also subsume the truth of the prejacent
- The inference may project though questions:

(57) a. Ngo m-zi Aaming jau-mou maai joengjuk, ...
1SG not-know Ming have-not.have buy lamb
'I don't know whether Ming bought lamb or not, ...'

b. ... # Aaming **zinghai** maai-zo joengjuk$_F$ **zaa4**?
Ming only buy-PERF lamb SFP.only.Q
'Did Ming only buy lamb?' (doubling, same for singleton cases)

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Appendix C: English scalar *only* vs. Cantonese doubling

- English scalar *only* is known to differ from quantificational *only* from two truth-conditional-related aspects (Klinedinst 2004, 2005; Beaver and Clark 2008; Coppock and Beaver 2014; Alxatib 2020):

#1 Non-logically weaker alternatives are *not* excluded when being lower ranked

(58) a. Jess only managed to interview John (quanitifcational)

b. Jess only managed to a [first lieutenant]$_F$ (scalar) (Alxatib 2020:30)
(Jess also interviewed second lieutenants)

#2 The ban on vacuous uses

(59) a. #Jackie was only born in [Boston]$_F$ (quanitifcational) (Alxatib 2020:45)

b. Did Jamie only get a [B]$_F$ on the test? (scalar) (Alxatib 2020:45)

Appendix C: #1: Lower ranked alternatives

(60) Context facilitating scalar reading with a rank order

Scenario: [Taiwan: 1 gold | Hong Kong: 1 silver 1 bronze]
Ming and you are discussing which team performed the best in the last Olympic game. You said: Taiwan was definitely better, because ...

a. #Gongdeoi **zinghai** ling-zo go aagwan$_F$ (aa3).
HK.team only get-ACHV CL 1st-runner-up SFP.
'#The only medal Hong Kong Team got was a silver. (What a loser.)'

b. ??Gongdeoi **zinghai** ling-zo go aagwan$_F$ **zaa3**.
HK.team only get-PFV CL 1st-runner-up SFP.only.
'Hong Kong Team only/just got a silver. (What a loser.)'

c. ?Gongdeoi ling-zo go aagwan$_F$ **zaa3**.
HK.team get-PFV CL 1st-runner-up SFP.only.
'Hong Kong Team only/just got a silver. (What a loser.)'

d. Gongdeoi **zihai** ling-zo go aagwan$_F$ **zaa3**.
HK.team just get-PFV CL 1st-runner-up SFP.only.
'Hong Kong Team just got a silver. (What a loser.)'

Appendix C: #1: Lower ranked alternatives (cont.)

- To naturally utter the sentences, either 'at most' is required, or the context needs to be adjusted explicitly to eliminate bronze in the comparison with Taiwan.

(61) Context focusing on the highest medal

Same scenario with (60). Ming argued that Hong Kong got more medals and should be better. You said: well, let's forget about the number and just focus on the highest one. Taiwan was better, because ...

a. ... Gongdeoi (zeoido) **zinghai** ling-zo go aagwan$_F$ (aa3).
... HK.team at.most only get-ACHV CL 1st-runner-up SFP.
'Hong Kong Team (at most) only got a silver.' (less preferred but acceptable)

b. ... Gongdeoi (zeoido) (**zinghai**) ling-zo go aagwan$_F$ **zaa3**.
... HK.team at.most only get-ACHV CL 1st-runner-up SFP.only.
'Hong Kong Team (at most) only/just got a silver.'

Appendix C: #2: The ban on vacuous uses

(62) Scenarios where only one alternative can be true

a. #Nei-jat fo Aaming **zinghai** ling-zo dai-ji ming.
this-one subject Ming only rank second rank.
'Ming only ranked the second (highest score) on this subject.'

b.?/??Nei-jat fo Aaming **zinghai** paai dai-ji ming **zaa3**.
this-one subject Ming only rank second place SFP.only.
'Ming only/just ranked the second (highest score) on this subject.'

c. Nei-jat fo Aaming **zihai** paai dai-ji ming **zaa3**.
this-one subject Ming just rank second rank SFP.only.
'Ming just ranked the second (highest score) on this subject.'