Bipartite exhaustification: Evidence from Vietnamese

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Wh-phrases as NPIs

- Wh-phrases in Vietnamese are ambiguous between an interrogative and an NPI reading (Bruening and Tran, 2006)

(1) John không đọc sách nào
John not read book which
'Which book did John not read?'
'John did not read any book.'

- We will not be concerned with the interrogative reading, and will gloss **quyển sách nào** 'book which' simply as ANY BOOK

Two morphological variants

- ANY has a more complex variant

(2) John không đọc bất kỳ quyển sách nào
John not read BK ANY BOOK
'John did not read any book'

Basic meaning: ∃

- ANY is ∃ and not wide-scope ∀

(3) Rất ít sinh viên đọc (bất kỳ) quyển sách nào
very few students read BK ANY BOOK
'Very few students x are such that x read a book.'
~~'Every book x is such very few students read x.'~~

Similarity to English

- The distribution of ANY and BK-ANY is largely similar to that of English **any** (Klima, 1964; Ladusaw, 1979).

(4) a. *John đọc (bất kỳ) quyển sách nào
John read BK ANY BOOK

b. John không đọc (bất kỳ) quyển sách nào
John not read BK ANY BOOK

Under modals

- Both ANY and BK-ANY are unacceptable under universal modal

(5) a. *John phải đọc quyển sách nào
John must read ANY BOOK

b. *John phải đọc bất kỳ quyển sách nào
John must read BK ANY BOOK

- Under existential modals, ANY is not acceptable but BK-ANY is

(6) a. *John được đọc quyển sách nào
John may read ANY BOOK

b. John được đọc bất kỳ quyển sách nào
John may read BK ANY BOOK

BK and FC

- Like English **any**, BK-ANY under $\Diamond$ gives rise to the "free choice" (FC) reading (Kamp, 1973; Chierchia, 2013)

(7) John được đọc bất kỳ quyển sách nào
John may read BK ANY BOOK
'$\forall x(x$ is a book $\rightarrow \Diamond$John reads $x)$'

Overview

- Observation
  - Among the contexts that license ANY, BK is obligatory under existential modals and optional in other environments
- Hypothesis
  - Licensing of ANY under existential modals requires the presence of an exhaustification operator, EXH
  - Licensing of ANY in other contexts allows but does not require EXH
  - BK is present if and only if EXH is present
- Plan for the talk
  - NPI licensing
  - Exhaustification
  - The syntactic relationship of EXH and BK
  - Open questions for future research in light of the proposed account

Covert domain restriction

- We assume quantificational determiners comes with a covert domain restriction (von Fintel, 1994).

(8) a. any_{D} book = a book in D
b. every_{D} book = every book in D

(9) a. John read $\text{any}_{\{a,b,c\}}$ book $\Leftrightarrow a \vee b \vee c$
b. John read $\text{every}_{\{a,b,c\}}$ book $\Leftrightarrow a \wedge b \wedge c$

Subdomain alternatives

- For any S which contains $\textbf{any}_{\mathbf{D}}$, a "subdomain alternative" of S is derived from S by replacing D with a subset of D

(10) $[S_1 \ldots \text{any}_{\{a,b,c\}} \ldots]$

a. $[S_1 \ldots \text{any}_{\{a,b,c\}} \ldots]$
b. $[S_2 \ldots \text{any}_{\{a,b\}} \ldots]$
c. $[S_3 \ldots \text{any}_{\{a,c\}} \ldots]$
d. $[S_4 \ldots \text{any}_{\{b,c\}} \ldots]$
e. $[S_5 \ldots \text{any}_{\{a\}} \ldots]$
f. $[S_6 \ldots \text{any}_{\{b\}} \ldots]$
g. $[S_7 \ldots \text{any}_{\{c\}} \ldots]$

- For the purpose of this talk we will presuppose that D is non-empty

Licensing ANY

(11) Licensing Condition
Any is acceptable in S only if S entails its subdomain alternatives

(Crnič, 2019a,b, 2020)

Predicted

Licensing Condition
Any is acceptable in S only if S entails its subdomain alternatives

(12) a. *John read any$_{\{a,b,c\}}$ book $= a \vee b \vee c$
b. *John read any$_{\{a,b\}}$ book $= a \vee b$

(13) a. John did not read any$_{\{a,b,c\}}$ book $= \neg(a \vee b \vee c)$
b. John did not read any$_{\{a,b\}}$ book $= \neg(a \vee b)$

(14) a. *John is required to read any$_{\{a,b,c\}}$ book $= \Box(a \vee b \vee c)$
b. *John is required to read any$_{\{a,b\}}$ book $= \Box(a \vee b)$

Not predicted

Licensing Condition
Any is acceptable in S only if S entails its subdomain alternatives

(15) a. John is allowed to read any$_{\{a,b,c\}}$ book $= \Diamond(a \vee b \vee c)$
b. John is allowed to read any$_{\{a,b\}}$ book $= \Diamond(a \vee b)$

Auxiliary hypothesis

Licensing Condition
Any is acceptable in S only if S entails its subdomain alternatives

Exhaustification
Sentences can be parsed with EXH

(Fox, 2007; Chierchia et al., 2012)

(16) a. John is allowed to read $\text{any}_{\{a,b,c\}}$ book $= \Diamond(a \vee b \vee c)$
b. John is allowed to read $\text{any}_{\{a,b\}}$ book $= \Diamond(a \vee b)$

(17) a. EXH(John is allowed to read $\text{any}_{\{a,b,c\}}$ book) $= \Diamond a \wedge \Diamond b \wedge \Diamond c$
b. EXH(John is allowed to read $\text{any}_{\{a,b\}}$ book) $= \Diamond a \wedge \Diamond b$

The intuition

- Exhaustification of S means assigning truth values to as many alternatives of S as possible (Bar-Lev and Fox, 2020).

(18) EXH(R)(S) = true iff

a. every alternative in I_S is true

b. every alternative in $E_S \cap R$ is false

E_S and I_S

(19) a. $S = \Diamond(a \vee b)$
b. $ALT(S) = \{\Diamond a, \Diamond b, \Diamond(a \wedge b)\}$

(20) a. $S \wedge \neg\Diamond a \wedge \neg\Diamond(a \wedge b)$
b. $S \wedge \neg\Diamond b \wedge \neg\Diamond(a \wedge b)$
c. $E_S = \{\Diamond(a \wedge b)\}$

(21) $E_S = \bigcap\{A \mid A$ is a maximal subset of $ALT(S)$ such that $\{S\} \cup \{\neg S' \mid S' \in A\}$ is consistent$\}$

(22) a. $S \wedge \neg\Diamond(a \wedge b) \wedge \Diamond a \wedge \Diamond b$
b. $I_S = \{\Diamond a, \Diamond b\}$

(23) $I_S = \bigcap\{A \mid A$ is a maximal subset of $ALT(S)$ such that $\{S\} \cup \{\neg S' \mid S' \in E_S\} \cup \{S'' \mid S'' \in A\}$ is consistent$\}$

R and the conveyed meaning

(24) $\mathrm{EXH}(R)(S) = \text{true}$ iff

a. every alternative in I_S is true

b. every alternative of $E_S \cap R$ is false

(25) $S = \Diamond(a \vee b)$

a. $E_S = \{\Diamond(a \wedge b)\}$

b. $I_S = \{\Diamond a, \Diamond b\}$

(26) a. $\mathrm{EXH}(E_S)(S) = \Diamond(a \vee b) \wedge \Diamond a \wedge \Diamond b \wedge \neg\Diamond(a \wedge b) =$
$\Diamond a \wedge \Diamond b \wedge \neg\Diamond(a \wedge b)$

b. $\mathrm{EXH}(\emptyset)(S) = \Diamond(a \vee b) \wedge \Diamond a \wedge \Diamond b =$
$\Diamond a \wedge \Diamond b$

Adding more disjuncts

(27) $S = \Diamond(a \vee b \vee c)$

a. $E_S = \{\Diamond(a \wedge b), \Diamond(a \wedge c), \Diamond(b \wedge c), \Diamond(a \wedge b \wedge c)\}$

b. $I_S = \{\Diamond a, \Diamond b, \Diamond c, \Diamond(a \vee b), \Diamond(a \vee c), \Diamond(b \vee c), \Diamond(a \vee b \vee c)\}$

(28) a. $EXH(E_S)(S) =$
$\Diamond a \wedge \Diamond b \wedge \Diamond c \wedge \neg\Diamond(a \wedge b) \wedge \neg\Diamond(a \wedge c) \wedge \neg\Diamond(b \wedge c)$

b. $EXH(\emptyset)(S) =$
$\Diamond a \wedge \Diamond b \wedge \Diamond c$

Alternatives of ANY

(29) $\text{ALT}(\Diamond\text{John read any}_{\text{D}}\text{ book}) =$
$\{\Diamond\text{John read any}_{\text{D}'}\text{ book}, \Diamond\text{John read every}_{\text{D}'}\text{ book} \mid \text{D}' \subseteq \text{D}\}$

(30) $\text{ALT}(\Diamond\text{John read any}_{\{a,b,c\}}\text{ book}) = \{\Diamond a, \Diamond b, \Diamond c, \Diamond(a \vee b), \Diamond(a \vee c), \Diamond(b \vee c), \Diamond(a \vee b \vee c), \Diamond(a \wedge b), \Diamond(a \wedge c), \Diamond(b \wedge c), \Diamond(a \wedge b \wedge c)\}$

Consequence

(31) a. $\Diamond$John read any$_{\{a,b,c\}}$ book $= \Diamond(a \vee b \vee c) = \Diamond a \vee \Diamond b \vee \Diamond c$

b. $\Diamond$John read any$_{\{a,b\}}$ book $= \Diamond(a \vee b) = \Diamond a \vee \Diamond b$

(32) a. EXH($\emptyset$)($\Diamond$John read any$_{\{a,b,c\}}$ book) $= \Diamond a \wedge \Diamond b \wedge \Diamond c$

b. EXH($\emptyset$)($\Diamond$John read any$_{\{a,b\}}$ book) $= \Diamond a \wedge \Diamond b$

Consequence

(33) EXH(R)(John read any$_{\{a,b,c\}}$ book) $\not\Rightarrow$
EXH(R)(John read any$_{\{a,b\}}$ book)

(34) EXH(R)($\neg$John read any$_{\{a,b,c\}}$ book) $\Rightarrow$
EXH(R)($\neg$John read any$_{\{a,b\}}$ book)

(35) EXH(R)($\Box$John read any$_{\{a,b,c\}}$ book) $\not\Rightarrow$
EXH(R)($\Box$John read any$_{\{a,b\}}$ book)

For cases without existential modals, EXH is immaterial: whether it occurs has no bearing on the Licensing Condition for NPIs

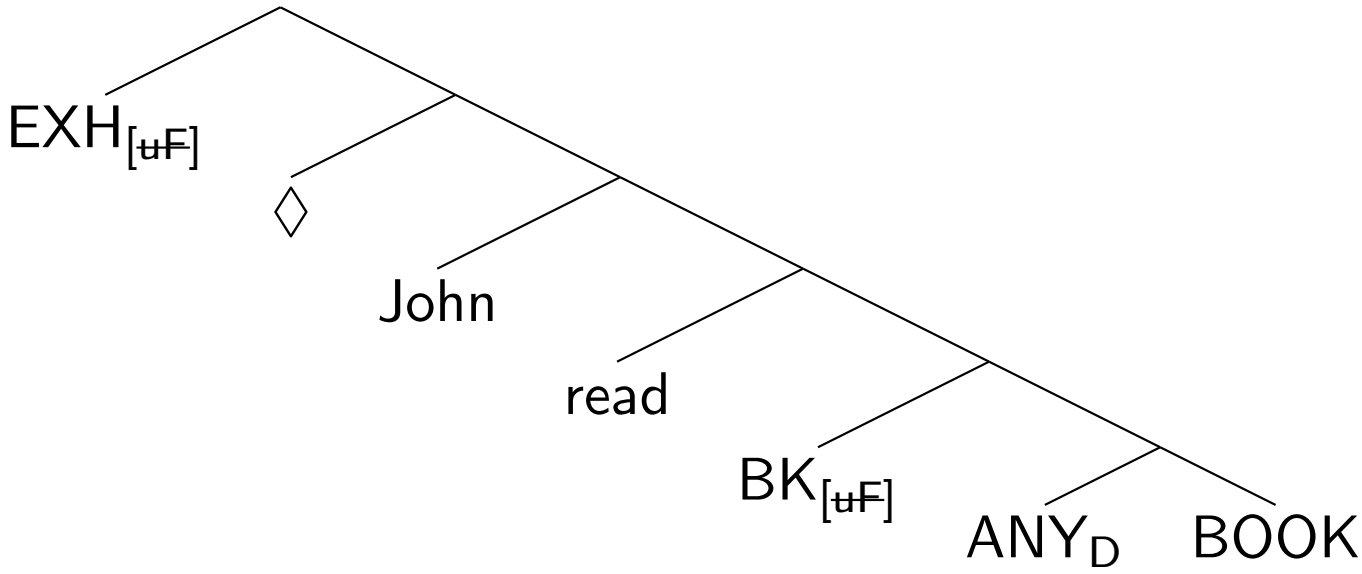
Recap

- Observation
  - Among the contexts that license ANY, BK is obligatory under existential modals and optional in other environments
- Hypothesis
  - Licensing of ANY under existential modals requires the presence of an exhaustification operator, EXH
  - Licensing of ANY in other contexts allows but does not require EXH
  - **BK is present if and only if EXH is present**

Agree

- Claim
  - EXH enter into an Agree relation with BK
  - BK just realizes [uF] and is semantically transparent

(36)



Bipartite **only**

It has been argued that English overt **only** are sometimes just a phonological reflex of focus marking (Barbiers, 2014; Hirsch, 2020).

(37) You're required to write only three paper

a. You_1 are [ONLY_{uF} required [t_1 to write only_{uF} three papers]
= the only requirement is that you write three papers

b. You_1 are required [ONLY_{uF} [t_1 write only_{uF} three papers]]
= the requirement is that you write three papers and no more

Bipartite **only** in Vietnamese

Vietnamese can realize the meaning of ONLY by way of two different morphemes (Erlewine, 2017).

(38) John chỉ yêu mỗi Mary
John only love only Mary
'John only loves Mary$_F$'

(39) Chỉ mỗi John hát mỗi một bài
ONLY only John sang only one song
'John sang one song & John did not sing two songs & no one else sang one song'

Bipartite negation

Negative quantifiers such as **no one** has been analyzed as $\exists$ agreeing with a remote NEG (Zeijlstra, 2004; Penka, 2011).

(40) The company needs to fire no employee

a. $\text{NOT}_{[F]}$ [need [$\exists_x$ the company fire ~~no~~$_{[F]}$ employee$_x$]]
= it is not necesary for the company to fire any employee

b. need [$\text{NOT}_{[F]}$ [$\exists_x$ the company fire ~~no~~$_{[F]}$ employee$_x$]]
= it is necessary that the company fires no employee

BK and negative bias

Both ANY and BK-ANY are licensed in yes/no questions. Only BK-ANY induces negative bias, similarly to minimizers in English (Guerzoni, 2004).

(41) a. John có đọc quyển sách nào không?
John YES read ANY BOOK NO
'Does John read any book?'

b. John có đọc bất kỳ quyển sách nào không?
John YES read BK ANY BOOK NO
'Does John read even one book?'

FC and negative bias

FC and negative bias are in complementary distribution.

(42) John có được đọc bất kỳ quyển sách nào không?
John YES may read BK ANY BOOK NO
a. 'Is it true that John can freely choose which book to read?'
b. 'Is John allowed to read even one book?'

BK and declarative questions

ANY is felicitous in declarative questions - i.e. yes/no questions formed by attaching a particle to a declarative - but BK-ANY is not.

(43) a. John đang đọc quyển sách nào à?
John is reading ANY BOOK Q
'John is reading a book?'

b. *John đang đọc bất kỳ quyển sách nào à?
John is reading BK ANY BOOK Q

Bar-Lev, Moshe, and Danny Fox. 2020. Free choice, simplification, and innocent inclusion. Natural Language Semantics 28:175 – 223.

Barbiers, Sjef. 2014. Syntactic doubling and deletion as a source of variation. In Linguistic Variation in the Minimalist Framework, ed. Carme M Picallo. Oxford University Press.

Bruening, Benjamin, and Thuan Tran. 2006. Wh-questions in Vietnamese. Journal of East Asian Linguistics 15:319–341.

Chierchia, Gennaro. 2013. Logic in grammar. Oxford: Oxford University Press.

Chierchia, Gennaro, Danny Fox, and Benjamin Spector. 2012. The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. In Semantics: An International Handbook of Natural Language Meaning, ed. Paul Portner, Claudia Maienborn, and Klaus von Heusinger. De Gruyter.

Crnič, Luka. 2019a. Any, alternatives, and pruning. Manuscript, The Hebrew University of Jerusalem.

Crnič, Luka. 2019b. Any: Logic, likelihood, and context. Language and Linguistic Compass 13:1–20.

Crnič, Luka. 2020. Number in NPI licensing. Manuscript, The Hebrew University of Jerusalem.

Erlewine, Michael Yoshitaka. 2017. Vietnamese focus particles and derivation by phase. Journal of East Asian Linguistics 26:325–349.

von Fintel, Kai. 1994. Restrictions on quantifier domains. Doctoral Dissertation, University of Massachussetts at Amherst.

Fox, Danny. 2007. Free choice disjunction and the theory of scalar implicatures. In Presupposition and Implicature in Compositional Semantics, ed. Uli Sauerland and Penka Stateva, 71–120. Palgrave-Macmillan.

Guerzoni, Elena. 2004. Even-NPIs in Yes/No questions. Natural Language Semantics 12:319–343.

Hirsch, Aron. 2020. *Only* as a concord phenomenon. Minicourse taught at the Hebrew University of Jerusalem.

Kamp, Hans. 1973. Free choice permission. Proceedings of the Aristotelian Society, N.S. 74:57–74.

Klima, Edward S. 1964. Negation in English. In The structure of language: Readings in the philosophy of language, ed. Jerry A. Fodor and Jerrold J. Katz, 246–323. Prentice Hall.

Ladusaw, William. 1979. Polarity Sensitivity as Inherent Scope Relations. Doctoral Dissertation, University of Texas Austin.

Penka, Doris. 2011. Negative Indefinites. Oxford University Press.

Zeijlstra, Hedde. 2004. Sentential Negation and Negative Concord. Utrecht: LOT.