

PhD Dissertation Oral Defense

Quantification and Plurality at the Interface: the case of Vietnamese

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Research questions

- Q#1: How are **quantificational strategies** encoded in Vietnamese, in particular the four most common universal D-quantifiers *tất-cả*, *cả*, *mọi*, and *mỗi*? How different/similar are their distributions and interpretations (e.g. *cả/*tất-cả/*mọi/*mỗi Nam và Mi đã tới* ‘Nam and Mi all arrived’)? (**Chapter 3**)
- Q#2: What is so special about **plurality** and **plural-marking** in Vietnamese? How different/similar are the distributions and interpretations of **plural markers** (PMs) *các* and *những* (e.g. **hai các/những * (con) chó* ‘two dogs’)? (**Chapter 4**)
- Q#3: When and why do we need or needn’t PMs like *các* and *những* in various quantificational constructions, including wh-quantification involving *cũng* (e.g. **những ai cũng đã giúp Nam* ‘everyone helped Nam’)? (**Chapter 5**)

The Proposal in a nutshell (Q#1)

- (1) a. **Tất-cả/*cả/mọi/?mỗi** sinh-viên đã có-mặt.
 ∀ student PST arrive
 ‘All the students arrived.’ (distributive)
- b. **Tất-cả/*cả/*mọi/*mỗi** các căn phòng ở-đây được sơn vàng.
 ∀ CLF PL room here PASS paint yellow
 ‘All the rooms are painted yellow.’ (distributive)
- c. **Cả/*tất-cả/*mọi/*mỗi** căn phòng này được sơn vàng.
 ∀ CLF room DEM PASS paint yellow
 ‘The whole room is painted yellow.’ (non-distributive)

Chapter 3

- *Tất-cả*, *cả*, *mọi*, and *mỗi* differ in their atomicity and uniformity presuppositions imposing on their nominal restrictors.

The Proposal in a nutshell (Q#2)

- (2) *Nam và Mi là **những**/các sinh-viên.*
nam and Mi COP PL student
'Nam and Mi are students.' (predicative)
- (3) *Có **những**?các cuốn sách trên bàn.*
have PL CLF book on table
'There are books on the table.' (existential)
- (4) ***Các** phương-tiện không được phép rẽ trái.*
CAC vehicle NEG allow turn left
'All the vehicles are not allowed to turn left.' (universal)
or 'The vehicles are not allowed to turn left.' (maximal)

Chapter 4

- Both *các* and *những* are best to be analyzed as syntactically **modifying PMs** and semantically instantiations of **the inclusive PL operator**.

The Proposal in a nutshell (Q#2)

The Q-analysis: Thompson (1988:180)

*“**Các** implies that all of a given set of entities are involved, while **những** suggests that only certain of the total possible number are referred to.”*

(5) The D-analysis of *các* and *những* (Nguyễn H.T. 2004:42)

- | | | |
|----|---|-----------------------|
| a. | một ‘one/a’ | [−Plural, − Definite] |
| b. | những ‘plural marker’ | [+Plural, −Definite] |
| c. | các ‘plural marker’ (< Chinese 各 ‘each’) | [+Plural, +Definite] |

Chapter 4

- Their quantifier-alike or determiner-alike behaviors are due to the ‘all or nothing’ effect involving definite plurals and the presence of covert operators, not by means of the (in)definiteness encoded in *các* or *những*.

The Proposal in a nutshell (Q#3)

- (6) Co-occurrence between *các/những* and various kinds of quantifiers
- a. *Tất-cả/một-số (các/những) sinh-viên của Nam đã bỏ phiếu.*
all/some PL student of Nam PST cast vote
'All/some of Nam's students cast the vote.'
 - b. *Tất-cả *(các/những) con chó này rất ngoan.*
all PL CLF dog DEM very well-behaved
'All these dogs are very well-behaved.'
 - c. *Tất-cả/một-số (các/những) con chó khu này rất ngoan.*
all/some PL CLF dog area DEM very well-behaved
'All/some of the dogs in this area are very well-behaved.'

Chapter 5

- The PMs *các/những* are only necessary when quantifiers select non-atomic restrictors (among other things).

Roadmap for today (focus on Q#1 & Q#2)

- 1 Background
- 2 Observations
- 3 Literature review
- 4 My proposal
- 5 Bottom lines

Syntactic structures of Vietnamese nominals

(7) The surface structure

Q - **PL** / Num - **CÁI** - CLF - Noun - AttrP - PossP - RC - DEM.

(Phan & Lâm 2021)

(8) a. *Bút trên bàn là của-tôi.*

pen on table COP mine

‘The pen(s) on the table is/are mine.’

(inclusive plural)

b. *Cây bút trên bàn là của-tôi.*

CLF pen on table COP mine

‘The pen on the table is mine.’

(singular)

c. *Các/những/mấy cây bút trên bàn là của-tôi.*

PL CLF pen on table COP mine

‘The pens on the table are mine.’

(exclusive plural)

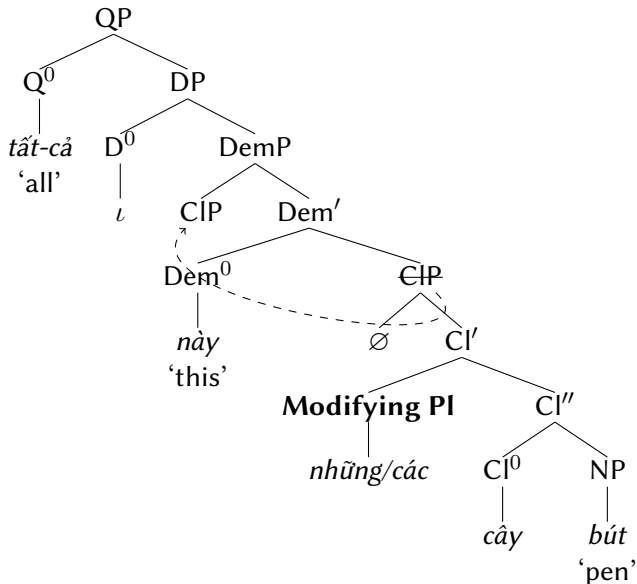
d. *Tất-cả ?(Các/những/mấy) cây bút trên bàn là của-tôi.*

all PL CLF pen on table COP mine

‘All the pens on the table are mine.’

(universal)

- (9) The LF of [*tất-cả* [[*những/các* [*cây* [*bút*]]] *này*]] ‘all these pens’



A semantics of plurality (Sauerland 2003, Martí 2020)

- (10) a. *Nam read books.*
 \rightsquigarrow Nam read more than one book. (exclusive plural)
- b. *Nam didn't read books.*
 \rightsquigarrow Not a single book did Nam read. (inclusive plural)

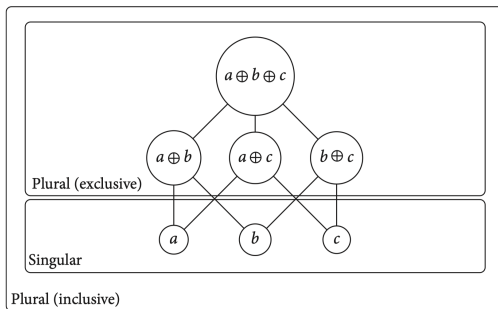


Figure 1: Singular vs. plural denotations (Champollion 2017:44)

Section 2

Observations

Plurality in Vietnamese: inclusive or exclusive?

- (11) *[[There are no **cats** on the mat]]* (Chierchia 2010:114)
 = False if there is one cat on the mat.
 → *[[cats]]* should be interpreted **inclusively**, i.e. denoting one or more than one cat in this downward-entailing (DE) context.
- (12) a. *Trên tấm đệm chẳng có con mèo nào.*
 on CLF mat NEG have CLF cat which
 ‘There are not any cats on the mat.’
- b. ?*Trên tấm đệm chẳng có những/các con mèo.*
 on CLF mat NEG have PL CLF cat
 Intended: ‘There are no cats on the mat.’
- (13) *Fido là (một)/*những/*các con chó.*
 Fido COP one/PL CLF dog
 ‘Fido is a dog.’ (upward-entailing (UE) context)

Evidence for inclusive plurality in Vietnamese

- DE contexts: negative, *if*-clause, wh-question, *no/few*-restrictor, etc.

(14) [Context: A asked about B's trip to Taipei yesterday with an expectation that B had visited at least two places there.]

- a. *Hôm-qua trời đẹp, cậu đã đi được **những-đâu** thế?*
 yesterday sky beautiful 2SG PST visit DUOC PL-where PRT
 'Yesterday was such a beautiful day, where did you visit?'
- b. *Tô đi được Cố Cung và Đạm Thủy.*
 1SG go DUOC Palace Museum and Tamsui
 'I visited the National Palace Museum and Tamsui.' (expected)
- c. *Tô đi được Cố Cung.*
 1SG go DUOC Palace Museum
 'I visited the National Palace Museum.' (unexpected)

How similar/different are *các* and *những*?

Table 1: Revisiting syntactic distributions of Vietnamese PMs *các* vs. *những*
(Bui M.H. 2000, Le & Schmitt 2016, among others)

Distributional features	NHỮNG	CÁC
Co-occur with quantifiers ‘ <i>all/most</i> ’	+	+
Co-occur with other quantifiers ‘ <i>every/several</i> ’	—	—
Co-occur with cardinal numerals	—	—
Require classifiers	+	+
Require <i>D(iscourse)</i> -linking contexts	+	+
Require restrictions on the NP subject	+	—
Co-occur with <i>wh</i> -elements	+	—
Compatible with existential environments	+	?
Allow generic/kind readings	+	+
Co-occur with relational nouns	—	+

Convergences between *những* and *các*

(15) Incompatibility with numerals

- a. **hai* *các/những* *chiếc* thuyền gỗ
 two PL CLF boat wood
 Intended: 'two wooden boats'
- b. **hai chiếc* *các/những* thuyền gỗ
 two CLF PL boat wood
 Intended: 'two wooden boats'

(16) Co-occurrence with classifiers

- a. *các/những* **(con)* chó đó
 PL CLF dog DEM
 'those dogs' (obligatory)
- b. *các/những* *(căn)* phòng trong ngôi-nhà này
 PL CLF room in house DEM
 'the rooms in this house' (optional)

Convergences between *những* and *các*

(17) Predicative uses

- a. *Nam và Mi là **những/các** sinh-viên (rất xuất-sắc).*
 Nam and Mi COP PL student very talented
 ‘Nam and Mi are (very talented) students.’ (predicative in Obj.)
- b. ***Những/các** con mỗi đã gặm hai cuốn sách của Nam.*
 PL CLF termite PST gnaw two CLF book POSS Nam
 ‘Termites have gnawed two books of Nam.’ (existential in Sub.)

(18) Generic uses

- a. ***Các/những** con khủng-long đã bị tuyệt-chủng.*
 PL CLF dinosaur PST PASS extinct
 ‘Dinosaurs were extinct.’ (kind reference)
- b. ***Các/những** con chó rất hung-dữ khi chúng bị đói.*
 PL CLF dog very dangerous when they PASS hungry
 ‘Dogs are dangerous when they are hungry.’ (generic generalization)

Definiteness effects involving *những* and *các*

- (19) [Anaphoric context: *Đầu năm mẹ mua cho Nam rất nhiều sách...*
 ‘Early this year, Mom bought for Nam many books (of many kinds)’]
- a. *Tất-cả* ***các*** *cuốn sách* *?(này)* *rất thú-vị.*
 all CAC CLF book DEM very interesting
 ‘All these books are very interesting.’
- b. *Tất-cả* ***những*** *cuốn sách* **(này)* *rất thú-vị.*
 all NHỮNG CLF book DEM very interesting
 Intended: ‘All these books are very interesting.’

- (20) [Immediate situation: no-turn-left instruction on a traffic sign]

Các *phương-tiện không được phép rẽ trái.*

CAC vehicle NEG allow turn left

‘All the vehicles are not allowed to turn left.’

or ‘The vehicles are not allowed to turn left.’ (universal/maximal)

Divergences between *những* and *các*

(21) Existential *có*-constructions (**not so obvious**)

- a. *Có* những /? *các* cuốn sách trên bàn.
 have PL CLF book on table
 ‘There are books on the table.’
- b. Nơi-đây xưa-kia thường có các cuộc hát ghẹo trong
 here long.ago commonly have CÁC event sing tease in
những ngày-lễ.
 NHỮNG holiday
 ‘Long time ago, there commonly were sing-to-tease events in the holidays here.’¹

- (22) Cô-ấy đã đi những/*các *đâu?*
 3.SG.F PST go PL where
 ‘Where did she visit?’ (implied: she visited more than one place)

¹Data retrieved from the corpus of Vietlex.

A summary: observations to be captured

Table 2: Summary of interpretations of *các/những*-plurals

Use	<i>các</i>	<i>những</i>	Notes
(i) Predicative use	+	+	<i>có</i> -sentences, Obj position, Sub of potential kind terms
(ii) Definite/anaphoric use	+	+	<i>những</i> requires restrictions in Sub/Restrictor position
(iii) Generic use	+	+	Sub/Obj in generic contexts
(iv) Wh-element use	—	+	only <i>những</i>

Section 3

Literature review

Previous accounts of *các/những*: Q-analysis

Thompson's implicit Q-analysis (1987:180)

“**Các** implies that all of a given set of entities are involved, while **những** suggests that only certain of the total possible number are referred to.”

⇒ PROBLEMS with existential quantification and Q-sensitive particles:

(23) *Một-số các sinh-viên đã có-mặt.*

some PL student PST arrive

‘Some students arrived.’

(existential)

(24) Diagnosis with Q-sensitive *hầu-như* ‘almost’

a. *Hầu-như tất-cả/mọi sinh-viên đã có-mặt.*

almost all/every student PST show.up

‘Almost all the students arrived.’

(canonical \forall)

b. ??*Hầu-như các sinh-viên đã có-mặt.*

almost CAC student PST show.up

Intended: ‘Almost all the students arrived.’

Previous accounts of *các/những*: D-analysis

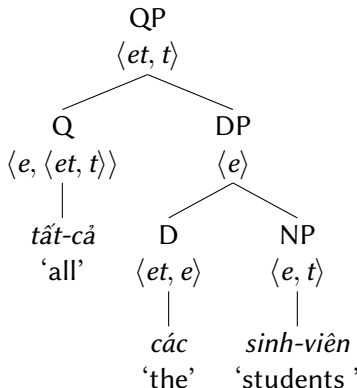
- (25) **Candidates for determiners in Vietnamese** (Nguyễn H.T. 2004)
- a. *một* ‘one/a’ [–Plural, – Definite]
 - b. *những* ‘plural marker’ [+Plural, – Definite]
 - c. *các* ‘plural marker’ (< Chinese 各 ‘each’) [+Plural, +Definite]
- (26) Phan & Chierchia’s (2022) counter-example (6)
- a. *the three books* (English)
 - b. **các ba cuốn sách*
CAC three CLF book
Intended: ‘the three books’ (Vietnamese)
- (27) Co-occurrence with demonstratives
- a. *(*the) those (*the) books* (English)
 - b. *những/các cuốn sách ấy*
PL CLF book DEM
‘those books’ (Vietnamese)

Matthewson's (2001) theory of domain restriction

■ Cross-linguistic strategies of domain restriction:

- (i.) Covert or overt means of domain restriction (cf. von Stechow 1994; Matthewson 2001, 2013; Giannakidou 2004, a.o.)
- (ii.) If being overt, where and how it takes place (cf. Martí 2002, 2009; Stanley and Szabó 2000; Etxeberria 2005, a.o.)

(28)



Problems of the D-analysis

- Predicative and generic uses?
- The general optionality of *các/những* in quantification?
- Type-mismatch between *những* (of type $\langle et, \langle et, t \rangle \rangle$ or $\langle e, t \rangle$) and *tất-cả*.
- **Các năm sinh-viên*
intended: 'the five students'

Le & Schmitt (2016): các/những-phrases as head plurals

Summary: though both of them head a Quantity Phrase, *các* and *những* c-select CIPs and relative clauses (CPs) as their complement, respectively.

Problems of Le & Schmitt's account

- (i.) **Compositionality problem:** It is not obvious how we can derive all the semantic mappings based on the relevant syntactic structures of *các/những* phrases.
- (ii.) **Uniformity problem:** Given the c-selectional distinction, it is not transparent how to account for various common features between these two plural markers, e.g., the incompatibility with numerals, the requirement of classifier phrases (see the top-half of **Table 1**).
- (iii.) **The optionality problem:** Given the head status of *các/những*, how do we account for their general optionality in many cases, e.g. *một-số/hầu-hết (các/những) sinh-viên* 'some/most students'?

Section 4

My proposal

Ontological assumptions (Link 1987, Landman 1989a,b)

- (29)
- a. $\llbracket \mathbf{Nam} \rrbracket = N$ (pure) atom
 - b. $\llbracket \mathbf{Nam\ và\ Mi}_{sum} \rrbracket = N \oplus M$ sum
 - c. $\llbracket \mathbf{Nam\ và\ Mi}_{group} \rrbracket = \uparrow(N \oplus M)$ group/impure atom

- (30) Denotations of Vietnamese **chó** ‘dogs’ (number-neutral), **con chó** ‘a/the dog’ (singular) and **những con chó** ‘dogs’ (semantically inclusive plural)

- a. Singular: $\llbracket \mathbf{con\ chó} \rrbracket = \{ a, b, c \}$
- b. (Inclusive) Plural (semantically):
 $\llbracket \mathbf{những\ con\ chó} \rrbracket = \llbracket \mathbf{chó} \rrbracket = \{ a, b, c, a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c \}$
- c. (Exclusive) Plural (pragmatically):
 $\llbracket \mathbf{những\ con\ chó} \rrbracket \rightsquigarrow \{ a \oplus b, a \oplus c, b \oplus c, a \oplus b \oplus c \}$

PMs *các* and *những* as inclusive PL operators-modifiers

Two types of plural markers in Vietnamese

- (i) Nominal plural markers (PM_{nom}): *những*, *các*, *mấy*
- (ii) Pronominal plural markers (PM_{pro}): *các*, *mấy*, *chúng*, *bọn*, *tụi*, *lũ*, etc.

- (31) The inclusive PL operator (Chierchia 2010:114)
 $\llbracket PL \rrbracket := \lambda P: P \text{ is an atomic predicate. } \lambda x. \exists Q [Q \subseteq P \wedge x = \oplus Q]$

Proposal: The modifier analysis

các and *những* semantically are instantiations of the inclusive PL operator in the sense of Chierchia (2010,2013) and syntactically function as modifying plurals in the sense of Wiltschko (2008).

Proposal: Lexical entries for *các* and *những*

- (32) a. $\llbracket \mathbf{các} \rrbracket^g = \lambda P_{\langle e, t \rangle} : P \text{ is an atomic property} \wedge \forall x [P(x) \rightarrow g(x)].$
 $\lambda x_e. [\exists Q [Q \subseteq P \wedge x = \oplus Q]]$
- b. $\llbracket \mathbf{những} \rrbracket = \lambda P_{\langle e, t \rangle} : P \text{ is an atomic property} \wedge \exists P' \text{ such that } P \subset P'.$
 $\lambda x_e. [\exists Q [Q \subseteq P \wedge x = \oplus Q]]$

Proposal: Differences between *các* and *những*

những is encoded with atomicity and domain widening (i.e. partitivity) presuppositions, whereas *các* is encoded with a contextually determined assignment function instead of the domain widening presupposition, though sharing the atomicity s-selection with *những*.

Capturing the convergences (1)

- (33) a. *Fido và Pluto là **những/các** con chó (thông-minh).*
 Fido and Pluto COP PL CLF dog smart
 ‘Fido and Pluto are (smart) dogs.’ (pragmatically exclusive)
- b. *Tôi không có (***các**/***những** đứa) con.*
 1SG NEG have PL CLF child
 ‘I don’t have children.’
 (violate Patel-Grosz & Grosz’s (2017) *Minimize DP!*)

- Incompatible with numerals and *mọi*: presuppositional failures.
- ‘Licensing by modification’ phenomenon: partitivity requirement.
- Appearing in existential and generic environments: derive from applying $\llbracket \text{những/các } P_{\langle e,t \rangle} \rrbracket$ to \exists and GEN, K operators (Trinh 2011).
- Their general optionality: due to their status as modifying plurals (i.e. adjuncts).

Capturing the convergences (2): the homogeneity effect

- (34) *Các phương-tiện không được phép rẽ trái.*
 CAC vehicle NEG allow turn left
 ‘All the vehicles are not allowed to turn left.’ (universal)
 or ‘The vehicles are not allowed to turn left.’ (maximal)
- (35) *Nam có ba sinh-viên nhưng tôi chưa gặp mặt các/những sinh-viên đó.*
 Nam have three student but 1SG NEG meet face PL
sinh-viên đó.
 student DEM
 ‘Nam has three students but I haven’t met those students in person.’
 \rightsquigarrow I haven’t met any of Nam’s students in person. ($\neg\exists$)

Homogeneity effect (Krifka 1996, Križ 2016, Križ & Spector 2021, a.o.)

Definite plurals cross-linguistically behave like \forall -QPs in UE environments and like \exists -QPs in DE ones.

Capturing the (in)compatibility with wh-nominals

- (36) a. $\llbracket ai \rrbracket^{w,g} = \llbracket người-nào \rrbracket^{w,g} = \lambda x_e. \lambda w_s. x \text{ is a person in } w$
 b. $\llbracket những ai \rrbracket^c = \lambda x_e. [\exists Q [Q \subseteq \{x: x \text{ is a person in } w\} \wedge x = \oplus Q \text{ in } c]]$
- (37) a. *Tôi không thích **những**/***các** người này.*
 1SG NEG like PL person DEM
 ‘I don’t like these people.’
 b. ***Các** người lui ra đi!*
 CAC_{pro} person move.back out PRT
 ‘Back away, you all!’

Speculation: a lexical idiosyncrasy

các ai/đâu/gì* is induced by the existence of $các_{pro}$ beside $các_{nom}$ in the lexicon: * $các_{nom}/các_{pro}$ **người (note that $\llbracket ai \rrbracket = \llbracket người + nào \rrbracket$).

Returning to \forall -quantifiers in Vietnamese

(38) Presuppositional account of *tất-cả*, *mọi*, and *mỗi*

- a. $\llbracket \textit{tất-cả} \rrbracket = \lambda X_{e: |X| > 1}. \lambda Q_{\langle e, t \rangle}. \forall x [\text{atom}(x) \wedge x \sqsubseteq X \rightarrow Q(x)]$
(where $\text{atom}(x) := \{x \in P: \neg \exists y. [y \sqsubset x \wedge P(y)]\}$ (for any predicate P))
- b. $\llbracket \textit{mọi} \rrbracket = \lambda P: |P| > 1 \ \& \ P \text{ is atomic}. \lambda Q. \forall x [P\text{-atom}(x) \rightarrow Q(x)]$
(where P is an atomic predicate iff $\llbracket P \rrbracket = \text{at}(\llbracket P \rrbracket)$)
- c. $\llbracket \textit{mỗi} \rrbracket = \lambda P_{\langle e, t \rangle}: |P| > 1 \ \& \ P \text{ is a uniform atomic predicate}. \lambda Q_{\langle e, t \rangle}: Q \text{ is distributive}. \exists X [X = \iota^* P \wedge \forall x [x \sqsubseteq X \rightarrow Q(x)]]$
(where P is distributive iff $\forall X [P(X) \rightarrow \forall x [x \sqsubseteq X \rightarrow P(x)]]$)

Crucial Finding

\forall -quantifiers in Vietnamese essentially share a cardinality requirement (i.e., $|P| > 1$) but differ in their atomicity (*tất-cả/cả* vs. *mọi/mỗi*) and uniformity (*mọi* vs. *mỗi*) presuppositions.

Capturing the facts (1)

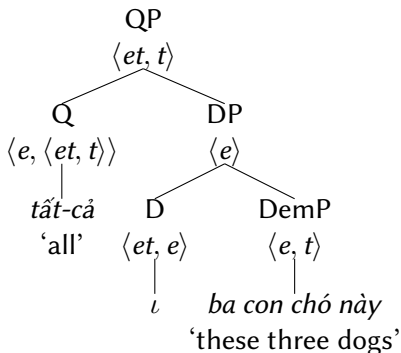
(39) *Tất-cả/*mọi/*mỗi* bọn-họ đã có-mặt.

∇ 3PL PST show.up

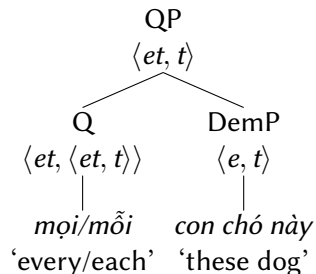
‘All of them shown up.’ (co-occurring with pronominals)

BUT: ✓ *Mọi/mỗi* đứa bọn-họ đã có-mặt.

(40) a.



b.



Capturing the facts (2): A demo

- Why #*mọi* + NumP (e.g. #*mọi/tất-cả/mỗi* ba sinh-viên)?

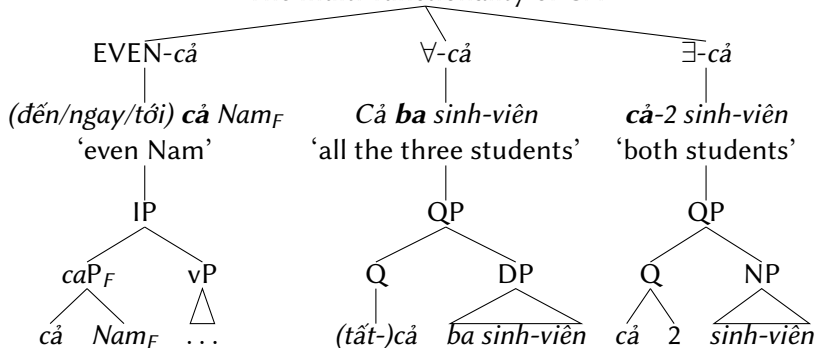
- (41) a. $\llbracket \textit{sinh-viên} \rrbracket = \lambda x. x \text{ is a } \textit{student}'\text{-atom (e.g. } \{a, b, c, d, e, f, \dots\})$
 b. $\llbracket \textit{ba} \rrbracket = \lambda P. \textit{at}(P). \lambda x \in D_e. *P\text{-atom}(x) \wedge |x| = 3$
 (following Ionin & Matushansky 2006)
 c. $\llbracket \textit{ba sinh-viên} \rrbracket = \lambda x. \textit{student}'\text{-atom}(x) \wedge |x| = 3$ (by FA)
 (e.g. $\{\{a, b, c\}, \{d, e, f\}, \dots\}$)
 (Informally, *ba sinh-viên* is a set of pluralities such that each of them consists of three students)
 d. $=^* \iota \Rightarrow \iota(\llbracket \textit{ba sinh-viên} \rrbracket) = \iota x. \textit{student}'\text{-atom}(x) \wedge |x| = 3$
 ($= \{a \oplus b \oplus c\}$) (following Dayal 2013)

⇒ **môi** disallows NumPs in the way that it disallows sums as plural DPs (compare **môi Nam và Mi*).

A note on *cả*-quantification

(42)

The multi-functionality of *CẢ*



Preliminary Finding (via non-homogeneity diagnoses)

Unlike other universal D-quantifiers, *cả* exhibits ambiguous interpretations in Vietnamese (\forall/\exists), which cries for future elaboration.

When PMs are necessary in Vietnamese (Q#3)?

- (43) a. *Một-số (các/những) nước Đông-Dương*
 some PL country Indochina
 ‘some Indochina countries’
- b. *Tất-cả *(các/những) nước Đông-Dương*
 some PL country Indochina
 ‘all Indochina countries’

(44) The lexical entry for the \exists -quantifier *một-số* ‘some’

- a. $\llbracket \textbf{một-số} \rrbracket = \lambda P_{\langle e,t \rangle} : |P| > 1. \lambda Q_{\langle e,t \rangle} . \exists x_e [P(x) \wedge Q(x)]$
- b. $\llbracket \textbf{một-số} \rrbracket (\llbracket \textbf{nước Đông-Dương} \rrbracket)$
 $= \lambda Q_{\langle e,t \rangle} . \exists x_e [x \text{ is an Indochina country} \wedge Q(x)]$ (by FA)

Proposal

PMs are needed to fulfill the quantifier’s s-selections w.r.t. its restrictor.

Section 5

Bottom lines

Bottom lines & Future extensions

- **Quantification:** A number of distinctive distributions/interpretations of the four most common universal D-quantifiers in Vietnamese can be captured by appealing to their different presuppositions involving cardinality, atomicity, and uniformity.
- **Plurality:** Contra Q-analysis and D-analysis, the peculiar distributions/interpretations of the PMs *các* and *những* can be captured in a finer-grained way if we take them as modifying PMs in the sense of Wilkschko (2008) that semantically function as the inclusive PL operator in the sense of Chierchia (2010,2013 with extra atomicity and partitivity presuppositions for *những*, and atomicity and a contextual restricting domain for *các*.
- **The Interface:** PMs are predicted to be optional in quantification if the relevant quantifier imposes no number-related presuppositions on its restrictor.

Future extensions (#1): elaborating on *cả*

- (45) a. *Cả/*Tất-cả con chó đang-kia ướt-đầm.*
 CA CLF dog over.there soaking.wet
 ‘The whole body of the dog over there is soaking wet.’ (CLPs)
- b. *Cả/Tất-cả ba con chó đang-kia ướt-đầm.*
 CA three CLF dog over.there soaking.wet
 ‘All the three dogs over there are soaking wet.’ (NumPs)
- c. *Cả/*Tất-cả Nam và Mi đã có-mặt.*
 CA Nam and Mi PST show.up
 ‘Nam and Mi all arrived.’ (sums)
- d. *Cả/*Tất-cả hội-đồng đã có-mặt.*
 CA committee PST show.up
 ‘All members of the committee arrived.’ (group terms)

Speculation

Cả behaves like a sum operator (i.e. \oplus) in forming groups and sums.

Future extensions (#2): the third nominal PM *mấy*

- (46) *mấy/*các/*những *(đứa) Nam*
 MAY/CAC/NHUNG CLF Nam
 ‘a group of people who Nam is included’

Hypothesis

- (47) The lexical entry for *mấy* (as a paucal-associative plural marker)
 $\llbracket \mathbf{mấy} \rrbracket = \lambda P \in D_{\langle e, t \rangle} : P \text{ is atomic} \wedge 2 \leq |P| \leq 10. \lambda x \in D_e.$
 $\neg P(x) \wedge \forall y[y \sqsubset x \wedge \text{atom}(y) \rightarrow P(y)]$

Future extensions (#3): pronominal PMs

Two types of plural markers in Vietnamese

- (i) Nominal plural markers (PM_{nom}): *những, các, mấy*
- (ii) Pronominal plural markers (PM_{pro}): *các, mấy, chúng, bọn, tụi, lũ*, etc.

- (48) a. **Hypothesis:** $\llbracket các_{pro} + X \rrbracket = \llbracket X-tati \rrbracket = \text{'X and other people associated with X' (X is a relational N)}$
- b. **Analysis:** Following Tomioka's (2021) account of Japanese *-tati*
 $\llbracket các_{pro} \rrbracket = \llbracket -tati \rrbracket = \lambda P_{\langle e, t \rangle}. \lambda Y_e. \exists x [P(x) \wedge x \sqsubset Y \wedge P \text{ represents } Y]$
- c. **Derivation:** $\llbracket các_{pro} \rrbracket (\llbracket thầy + PRO \rrbracket)$
 $= \lambda Y_e. \exists x [\text{teacher-of-PRO'}(x) \wedge x \sqsubset Y \wedge \text{teacher-of-PRO' represents } Y]$

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