

# A neo-Heimian theory of (in)definiteness and exceptional wide scope

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# (In)definiteness marking

## Cross-linguistic variation

- Some languages obligatorily mark **(in)definiteness** (e.g., *the* vs. *a* in English)
- Other languages do not (e.g. Japanese, Russian, Thai, Latin)

## The textbook semantics of indefinite and definite noun phrases

- "A cat jumped" is true iff there is a cat that jumped ( $\exists x[C(x) \wedge J(x)]$ )
- "The cat jumped"
  - presupposes that there is a unique (relevant) cat ( $\exists!x[C(x)]$ )
  - is true iff that cat jumped ( $J(\iota x[Cx])$ )

# Goals

Synthesis of two (old) ideas in a novel formal theory

1. Definite and indefinite noun phrases have the same assertive meaning, contrary to the textbook semantics
  - Heim's 1982 **File Change Semantics** is built on the same idea but various empirical issues are known
  - Heim's 1991 idea of **anti-presuppositions** (also Farkas 2006, Grønn & Sæbø 2012, Hawkins 1978, 1991, Heim 2011, Percus 2006, among others)
2. Indefinite noun phrases receive exceptional wide scope via presupposition projection (Cresti 1995, van Geenhoven 1998, Yeom 1998, Jäger 2007, Geurts 2010, Onea 2015)

## Part 1

# A neo-Heimian theory of (in)definiteness

# Roadmap for Part 1

1. (Conceptual) motivations for the uniform approach to definite and indefinite noun phrases

1.1 Languages without (in)definiteness marking

1.2 (In)definiteness and  $\phi$ -features

1.3 Competition effects

2. A static uniform analysis of definite and indefinite noun phrases

- Indefinite and definite noun phrases are both existential quantifiers
- Definite noun phrases carry uniqueness presuppositions

# 1. Motivation for the uniform approach

# 1.1 Languages without (in)definiteness marking

**Observation:** Japanese 'bare' noun phrases correspond to definite and indefinite noun phrases in English

- (1) a. 学期末までに論文を書いて提出する必要があります  
b. 毎日バナナを食べます
- (2) a. 被害者は、20代の男性だった  
b. 友達が本をくれたんだけど、著者が親戚だった  
c. 山田先生のだの論文も、第一著者は学生だ

# Remarks on optional (in)definiteness marking

- Japanese does have ways of forcing indefinite readings (sometimes 'partitive')
  - Floating NUM+CL
  - Phrases like "ある", "とある", "いくつか", etc.
- Demonstratives are universal, and often (if not always) favor definite readings
  - NB: Definiteness and demonstratives are separated in some languages (e.g., Modern Greek, Hungarian)
- Pronouns are universally available; many languages allow phrases like "我々日本人", which is definite



# Possible analyses of languages w/o (in)def marking

- **Ambiguity:** Noun phrases are universally definite or indefinite, both syntactically and semantically, but in some, the distinction is not (obligatorily) overtly expressed
  - All languages can be analysed uniformly
  - 'Generalizing to the worst case'
- **Underspecification:** Noun phrases in languages like Japanese are simply underspecified for (in)definiteness both syntactically and semantically
  - Syntactic arguments (Fukui 1986, Bošković 2005, 2008, 2009, 2012, Baker 2003)
  - But how is the semantics supposed to work?

## 1.2 (In)definiteness and $\phi$ -features

A strong conceptual argument for favouring the underspecification view is **parsimony**

Crosslinguistically, there are other types of nominal marking that are only expressed only in some languages ( **$\phi$ -features**):

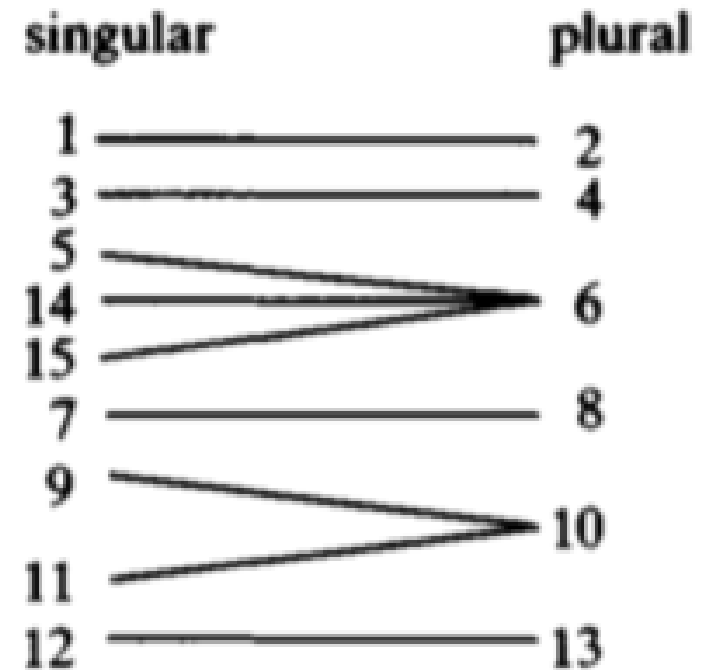
- Gender (alt: noun class)
- Number

Japanese noun phrases are underspecified for gender and number as well

Should we postulate covert gender and number distinctions in Japanese, or should we simply assume Japanese noun phrases to be simply underspecified?

# Gender

- (Grammatical) gender is defined in terms of agreement/concord with D, A, V, etc. (not to be conflated with nominal inflection)
- Cross-linguistic variation (cf. [WALS](#))
  - No distinction (Japanese, Hungarian, English, etc.)
  - 2-way (French, Italian, Dutch, etc.)
  - 3-way (Russian, German, Romanian, Tamil, etc.)
  - 4-way (Zande, Dyirbal, Lak, etc.)
  - 5+-way (Bantu languages)
- Ambiguity or underspecification?



(Bantu genders; Corbet 1991: 156)

# Number

- (Grammatical) number is defined in terms of inflection/affixation and agreement/concord with D, A, v, etc.
- Japanese has optional plural marking, but no singular-marking (e.g. たち、山々、国々)
- English has two dimensions of distinction
  - mass vs. count
  - count singular vs. count plural
- More number categories: dual, paucal, greater plural, general number, singulative/collective, etc.
- Again, ambiguity or underspecification?

# (In)definiteness as a $\phi$ -feature

Common properties of  $\phi$ -features

A. Syntactic agreement/concord

B. Inconsistent semantics

C. Competition effects

(In)definiteness exhibit all of these properties

# A. (In)definiteness agreement

Gender and number agreement seems to be more common, but (in)definiteness agreement is attested, e.g. Hungarian

(1) olvas-**ok**                      **egy** könyv-et  
read-1SG.PRES.INDEF **a**    book-ACC  
'I read a book'

(2) olvas-**om**                      **a**    könyv-et  
read-1SG.PRES.DEF **the** book-ACC  
'I read the book'

(Lyons 1999: 208)

Cf. Differential object marking in Turkic languages, etc.

## B. Inconsistent semantics: gender & number

- **Gender:** e.g. Italian
  - Natural gender (*ragazzo* vs. *ragazza* 'child')
  - No meaning (*persona* 'person')
  - Idiosyncratic semantics (*mela* 'apple' vs. *melo* 'apple tree')
- **Number:** e.g. English
  - Prototypical mass vs. singular count vs. plural count (*sweat* vs. *child* vs. *children*)
  - Grammatically mass (*furniture, footwear, stuff*)
  - Grammatically count (*mashed potatoes, clouds, noodles*)
  - Pluralia tantum (*trousers*)

## B. Inconsistent semantics: (in)definiteness

- Some cases of (in)definiteness marking have no obvious semantics
  - *the wrong* (Schwarz 2020)
  - *the occasional* (Bolinger 1967, Stump 1981)
  - *the majority*, "half of the books" in some languages, e.g., Hungarian *a könyv fele* (lit. 'the book half'), Greek *τα μισά βιβλία* (lit. 'the half books')
- *the same, the only*, relative/comparative readings of superlatives and ordinals (Heim 1985, Szabolcsi 1986)
- 'Weak definites', e.g. *He's going to the hospital. You should, too.* (Aguilar-Guevara 2014, Aguilar-Guevara & Oggiani 2023, Carlson & Sussman 2005)



## C. Competition effects: gender and number

A  $\phi$ -feature often (but not always) has an unmarked category, and triggers a competition effect (Sauerland 2008)

- **Gender** (Bobaljik & Zocca 2011, Spathas & Sudo 2020, Sudo & Spathas 2020)
  - unmarked masc. in Italian: *figlio* 'son', *figlia* 'daughter', *figli* 'children', *figlie* 'daughters'; *non ho un figlio*
  - unmarked fem. in Greek: *γάτος* 'male cat', *γάτα* 'cat', *γάτοι* 'male cats', *γάτες* 'cats' (NB: no competition effects)
- **Number** (Sauerland 2003, Spector 2007, Zweig 2009, Sudo 2023)
  - unmarked plural in English: *I have PhD students vs. I don't have PhD students*

## C. Competition effects: (in)definiteness

Hawkins (1978, 1991) and Heim (1991, 2011) argue that the semantics and pragmatics of indefinite noun phrases are best understood in terms of competition (also Farkas 2006, Grønn & Sæbø 2012, Percus 2006)

(1) Richard heard the Beaux-Arts Trio last night and afterwards  
had a beer with a/the pianist. (Heim 1991)

- The textbook analysis:  $\exists x[P(x) \wedge B(r)(x)]$  vs.  $B(r)(\iota x[P(x)])$
- The indefinite suggests that the pianist in question is not the pianist from the Beaux-Arts Trio (Menahem Pressler)

# Taking stock

(In)definiteness marking has some properties commonly found with  $\phi$ -features

- A. Syntactic agreement/concord
- B. Inconsistent semantics
- C. Competition effects

The absence of gender and number marking is analyzed in terms of underspecification

👉 Underspecification analysis of languages without (in)definiteness marking

# The semantics of $\phi$

The semantics of gender and number marking is a controversial topic, but there are some common assumptions:

- $\phi$ -features add information but do not affect semantic types
- Languages without  $\phi$ -marking are simply underspecified

E.g. Greek vs. Japanese

- $\llbracket \text{δάσκαλος}_{\text{M.SG}} \rrbracket = \lambda x_e. \mathbf{atom}(x) \wedge \mathbf{*teacher}(x)$
- $\llbracket \text{δασκάλα}_{\text{F.SG}} \rrbracket = \lambda x_e. \mathbf{atom}(x) \wedge \mathbf{*female}(x) \wedge \mathbf{*teacher}(x)$
- $\llbracket \text{δάσκαλοι}_{\text{M.PL}} \rrbracket = \lambda x_e. \mathbf{*teacher}(x)$
- $\llbracket \text{δασκάλες}_{\text{F.PL}} \rrbracket = \lambda x_e. \mathbf{*female}(x) \wedge \mathbf{*teacher}(x)$
- $\llbracket \text{先生} \rrbracket = \lambda x_e. \mathbf{*teacher}(x)$

## **2. A uniform analysis of (in)definiteness**

## 2.1 Historical remarks

# Textbook analysis: Frege-Strawson

- "A cat jumped" is true iff there is a cat that jumped ( $\exists x[C(x) \wedge J(x)]$ )
- "The cat jumped"
  - presupposes that there is a unique (relevant) cat ( $\exists!x[C(x)]$ )
  - is true iff that cat jumped ( $J(\iota x[Cx])$ )

Heim & Kratzer 1998 denotations (ignoring presupposition projection)

- $\llbracket \mathbf{a} \rrbracket = \lambda P_{et}. \lambda Q_{et}. \{x \in \text{dom}(P) \mid P(x) = 1\} \cap \{x \in \text{dom}(Q) \mid Q(x) = 1\} \neq \emptyset$
- $\llbracket \mathbf{the} \rrbracket$   
 $= \lambda P_{et}: |\{x \in \text{dom}(P) \mid P(x) = 1\}| = 1. \lambda Q_{et}. Q(\iota x \in \text{dom}(P)[P(x) = 1]) = 1$   
(or  $\lambda P_{et}: |\mathbf{max}\{x \in \text{dom}(P) \mid P(x) = 1\}| = 1. \lambda Q_{et}. Q(\iota y[y \in \mathbf{max}\{x \in \text{dom}(P) \mid P(x) = 1\}]) = 1$ )

# Heim's 1982 ideas in a nutshell

The textbook analysis assigns different assertive meanings to indefinite and definite noun phrases

Heim 1982 proposed a uniform analysis that both indefinite and definite noun phrases are both variables and they have different presuppositions

- "A cat jumped"  $\leadsto [C(x) \wedge J(x)]$ , presupposing that  $x$  is a new variable
- "The cat jumped"  $\leadsto [C(x) \wedge J(x)]$ , presupposing that  $x$  is an old variable

The existential force of indefinite noun phrases comes from the truth-definition and the existential closure embedded in the meanings of connectives and quantifiers



# After Heim 1982

(Possible) reasons why Heim abandoned dynamic semantics

- Her analysis of definite noun phrases wasn't complete
  - Unique definites, *the moon*
  - The problem of quantifying-in, *Every cat despises the human it lives with*
- Unselective binding failed ('Proportion Problem'), undermining her theory of dynamic quantification
- Heim's main argument for dynamic binding was significantly weakened by Situation Semantics (Heim 1990, Elbourne 2005; but see Mandelkern & Rothschild 2019)

## After Heim 1982 (cont.)

Heim moved on to a situation-based static theory of donkey anaphora in Heim 1990

Heim 1991 proposed to drop the Novelty Condition for indefinite noun phrases and to explain their usage restrictions in terms of competition effects (**anti-presuppositions**)

Towards the end of her linguistic career, she came back to dynamic semantics but (I believe) published no paper

# Other developments in dynamic semantics

- Presupposition projection (Heim 1983, Beaver 2001, Rothschild 2011; see also Van der Sandt 1992, Geurts 1999)
  - This literature doesn't say much about indefinites, anaphora, and quantification
- European groups: DRT (Kamp & Reyle 1993), DPL (Groenendijk & Stokhof 1991)
  - The development of selective dynamic quantifiers in the 1990s (Van Eijck & De Vries 1992, Kanazawa 1993, 1994, Van den Berg 1991, Van den Berg 1996, Chierchia 1992, 1995)
- More recent works on anaphora in dynamic semantics: e.g. Nouwen 2003, 2007, Brasoveanu 2007, 2008, 2010, Dotlačil 2013, Köpping 2018, Hofmann 2019, Köpping 2019, Elliott 2020, Hofmann 2022, Mandelkern 2022, Elliott 2024

## 2.2 A uniform static analysis

# Existential meaning for both

## Proposal

- Both indefinite and definite noun phrases to be existential quantifiers
- The definite article triggers a unique (maximality) presupposition

(1) a.  $\llbracket \mathbf{a} \rrbracket = \lambda P_{et}. \lambda Q_{et}.$

$$\{x \in \text{dom}(P) \mid P(x) = 1\} \cap \{x \in \text{dom}(Q) \mid Q(x) = 1\} \neq \emptyset$$

b.  $\llbracket \mathbf{the} \rrbracket = \lambda P_{et}: |\{x \in \text{dom}(P) \mid P(x) = 1\}| = 1. \lambda Q_{et}.$

$$\{x \in \text{dom}(P) \mid P(x) = 1\} \cap \{x \in \text{dom}(Q) \mid Q(x) = 1\} \neq \emptyset$$

We'll focus on singular count cases; non-singular definites trigger 'homogeneity effects'

(see Križ 2015, 2019, Križ & Spector 2021, Bar-Lev 2018, 2021)

# Anti-presuppositions

We adopt Heim's 1991 idea that the indefinite article has the definite article as its competitor with respect to the principle of *Maximize Presupposition!*

(1) Maximize Presupposition!

The use of  $\phi$  in  $c$  is infelicitous if  $\phi$  has an alternative  $\psi$  s.t.

- $\phi$  and  $\psi$  have the same assertive meaning
- $\phi$  presupposes less than  $\psi$
- The presuppositions of  $\psi$  are satisfied in  $c$

Although 'a' triggers no presupposition, it triggers an anti-presupposition via competition

# Unique definite vs. \*unique indefinite

If it is commonly known that the NP has a unique verifier, then the indefinite article is infelicitous

Conversely, if an indefinite article is felicitously used, it shouldn't be commonly known that there is a unique verifier of the NP (i.e. it's either commonly unknown or commonly known to be false)

- (1) a. I can see #a/the moon.
- b. I read a/the paper that Chomsky published last year.

# Accommodation

Often the uniqueness presupposition of a definite noun phrase can be accommodated; an indefinite triggers an anti-presupposition with respect to the accommodated meaning

(1)

A: What's wrong with Bill?

B: Oh, the woman he went out with last night was nasty to him.

(Hawkins 1978: 131)

- The uniqueness presupposition is easily accommodated here
- Using "a" is possible, but suggests that there were multiple women that Bill went out with last night



# Familiar definite

(1) I saw a cat and a dog on the street. The dog was barking at the cat.

A familiar definite does not presuppose uniqueness in the absolute sense

One way to analyze this is by assuming a free variable in "the dog" (Schwarz 2009; see also Fox 2000)

(2) [the [ dog [ IDENT x ] ]]

- $\llbracket \text{IDENT} \rrbracket^g = \lambda x_e. \lambda y_e. y = x$
- $\llbracket \text{IDENT } x \rrbracket^g = \lambda y_e. y = g(x)$

# Bridging definite

(1) I bought an electric guitar. But the pickup was broken.

(2) [the [ pickup [ R x ]]]

- 'x' refers to the electric guitar I bought
- 'R' is the relation of (inalinable) possession

NB: This is a case of an accommodated presupposition, as a guitar may have multiple pickups; 'a' would be felicitous if the guitar had multiple pickups

# No competition

In some constructions indefinites are felicitous even if the NP is known to have a unique verifier (Hawkins 1978)

- (1) a. If the fish still has a head, I won't eat it.  
b. I'm sure that there's is a shortest distance between two points. (Hawkins 1991: 435)

Such cases could be said to lack the definite counterpart for grammatical reasons

# A side note on the Beaux-Arts Trio

*Maximize Presupposition!* is not enough to account for Heim's Beaux-Arts Trio example

(1) Richard heard the Beaux-Arts Trio last night and afterwards  
had a beer with a/the pianist. (Heim 1991)

- Under the intended reading, "the pianist" is analyzed as "[the [pianist [R x]]]"
- "[a [pianist [R x]]]" should trigger (with an appropriate R) the anti-presupposition that it's not commonly known that the BAT has a unique pianist
- Assuming the plain indefinite "[a pianist]" only competes with "[the pianist]", it should just anti-presuppose that there is a unique pianist in the universe

We also need to exhaustify on top with respect to the bridging definite

# An underspecification analysis for Japanese

As Heim (1991, 2011) suggested, we can have an underspecification analysis of languages without definiteness marking

- "A cat is sleeping" is true iff  $\exists x[Cx \wedge Sx]$
- "The cat is sleeping"
  - Presupposes  $\exists!x[Cx]$
  - is true iff  $\exists x[Cx \wedge Sx]$
- "猫が寝ている" and "Кошка спит" are true iff  $\exists x[Cx \wedge Sx]$