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

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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 2

Indefinites with exceptional wide scope

Roadmap for Part 2

1. Basic facts about quantifier scope
   1.1 Constraints on quantifier scope
   1.2 Indefinites with exceptional wide scope

2. Exceptional wide scope via presupposition projection
   2.1 A neo-Heimian dynamic semantics
   2.2 Wide scope via presupposition projection
   2.3 Intermediate scope readings

(No time for comparisons with other theories of exceptional wide scope today)

1. Basic facts about quantifier scope

Quantifier scope ambiguity

(1)

Every boy watched a French film.

a. $\forall x[Bx \rightarrow \exists y[Fy \wedge Wxy]]$ surface scope: every > a

b. $\exists y[Fy \wedge \forall x[Bx \rightarrow Wxy]]$ inverse scope: a > every

(2)

A man is standing in front of every building.

a. $\exists x[Mx \wedge \forall y[By \rightarrow Sxy]]$ surface scope: a > every

b. $\forall y[By \rightarrow \exists x[Mx \wedge Sxy]]$ inverse scope: every > a

Constraints on quantifier scope

Fact 1: Quantifier scope in natural language is constrained

A. Structural constraints ('scope islands')

B. Scope freezing constructions

C. Semantic constraints

Fact 2: Indefinites do not abide by these constraints

1.1 Constraints on quantifier scope

A. Structural constraints ('scope islands')

(1) Somebody met a boy who has watched every French film.

    a. some, a > every

    b. *every > some, a

(2) A boy [watched every French film and then went to bed].

    a. a > every

    b. *every > a

(3) A boy hopes that the president will watch every French film.

    a. a > every

    b. *every > a

Some exceptions

(1) a. I demanded that you read not a single book. (Fox 2003: 85)

b. Determine wheather each number in the list is even or odd. (Szabolcsi: 107)

c. Someone is always willing to believe that every politician is corrupt. (Reinhart 1997: 349)

d. Every child who was born to every famous woman became famous too. (Winter 1997: 417)

e. A delegate who was elected from each distrit was disqualified. (Winter 1997: 417)

f. Somebody said that he could jump over every frog that Jessie did. (Syrett 2015: 585)

B. Scope freezing

The most famous case is the English double object construction (Larson 1990)

```
(1) You showed a child every picture.
      a. a > every
      b. *every > a                                  (Larson 1990: 603f)
```

Compare

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(2)
      a. You showed a picture to every child.
      b. You showed every picture to a child.
```

C. Semantic constraints

Inverse scope readings are significantly harder when downward entailing quantifiers are involved (cf. Mayr & Spector 2012)

(1) A PhD student presented every paper.

(2) a. No PhD student presented every paper.
    b. A PhD student presented no paper.

1.2 Indefinites with exeptional wide scope

Exceptional wide scope: A. Scope islands

(1) a. If every relative of mine dies, I will inherit a house.
b. If some relative of mine dies, I will inherit a house.

(Reinhart 1997: 342)

(2) a. Somebody read every novel and exercised after dinner.
b. Everybody read some novel and exercised after dinner.

(3) a. John overheard the rumor that each student of mine had been called before the dean.
b. John overheard the rumor that a student of mine had been called before the dean.

(Fodor & Sag 1982: 369)

Exceptional wide scope: B. Scope freezing

(1) a. I showed a child every painting by Van Gogh.
    b. I showed every child a painting by Van Gogh.

(2) a. The professor assigned some PhD student every article in this volume.
    b. The professor assigned every PhD student some article in this volume.

Exceptional wide scope: C. Semantic constraints

(1) a. No PhD student presented every paper about quantifiers.
    b. No PhD student presented a paper about quantifiers.

The issue

Standard assumption: the same scope shifting mechanism (e.g. Quantifier Raising, type-shifting) applies to all quantificational noun phrases

Issue: If we assume that the scope shifting mechanism is constrained (structurally and semantically), then we undergenerate for indefinites with exceptional wide scope

Standard answer: A different mechanism for indefinites' exceptional wide scope, e.g.

- Choice functions (Reinhart 1997, Winter 1997, Kratzzer 1998, Chierchia 2001, Schwarz 2001, 2011)
- **Presupposition projection** (Cresti 1995, van Geenhoven 1998, Yeom 1998, Jäger 2007, Geurts 2010, Onea 2015)

Non-standard answer: Different constraints for different scopal elements (Barker 2022)

What indefinites with exceptional wide scope are not

- Definite noun phrases pragmatically presuppose uniqueness (unique maximality, more generally), sometimes with respect to some discourse information (recall IDENT, R), as common knowledge; exceptional wide scope indefinites do not
- Partitive indefinites (e.g. *some of my supervisees*) have definite domains; the scope of the indefinite part is independent
- 'Epistemic specificity' (Farkas 1995, 2002a,b), e.g. *a certain*, "ある", *koe*-wh indefinites in Russian

Specificity marking

'Specific indefinite' has never been given a clear definition (Farkas 1995, 2002a,b)

Differential Object Marking in languages like Turkish forces wide scope

(1)

Ali bir piyano(-yu) kiralamak istiyor.
Ali one piano(-ACC) rent.INF wants
'Ali wants to rent a piano.' (Enç 1991: 4f)

- one > want, with ACC
- want > one, without ACC

In addition, definite objects are obligatorily accusative marked

2. Wide scope via presupposition projection

Idea in a nut-shell

- Definite and indefinite noun phrases assert existence; definite noun phrases presupposes uniquenes (existence + 'at most one')
- 'Specific indefinites' presuppose existence

	definite	**specific indefinite**	**plain indefinite**
presupposition	unique	existence	none

English articles	the	a/some	
Turkish objects	X	accusative	no case (nominative)
Japanese nouns	X	bare nouns	

2.1 A neo-Heimian dynamic semantics

A neo-Heimian dynamic semantics

- A context is a set of total assignments $a : \mathbb{N} \cup \{0\} \to \mathcal{D} \cup \mathcal{W}$ s.t.
  - $a(0) \in \mathcal{W}$
  - $a(n) \in \mathcal{D}$ for each $n \in \mathbb{N}$
- Sentences denote Context Change Potentials (CCPs) = functions over contexts
- A (plain) indefinite statement is eliminative
  - $c[\mathsf{a}^3\ \textsf{cat jumped}] = \{a \in c \mid \mathbf{cat}_{g(0)}(g(3)) \wedge \mathbf{jumped}_{g(0)}(g(3))\}\backslash$
    $= c[\mathbf{cat}(3)][\mathbf{jumped}(3)]$
  - We can assume that all noun phrases are associated with a new variable
- ϕ is true with respect to c iff $c[\phi] \neq \emptyset$

Turning Part 1 dynamic

- A plain indefinite has no presupposition
  - $c[\mathsf{a}^3\ \mathsf{cat}\ \mathsf{jumped}] = \{a \in c \mid \mathbf{cat}_{g(0)}(g(3)) \wedge \mathbf{jumped}_{g(0)}(g(3))\}\backslash$
    $= c[\mathbf{cat}(3)][\mathbf{jumped}(3)]$
- A definite statement has a uniqueness presupposition (to be revised)
  - $c[\mathsf{the}^3\ \mathsf{cat}\ \mathsf{jumped}]$
    $= \begin{cases} \# & \text{if for some } a \in c, |\{x|\mathbf{cat}_{a(0)}(x)\}| \neq 1 \\ c[\mathbf{cat}(3)][\mathbf{jumped}(3)] & \text{otherwise} \end{cases}$
  - 3 is assumed to be a new variable
  - This is a unique definite

Turning Part 1 dynamic (cont.)

Notation: $c[3 = 8] = \{a \in c \mid a(3) = a(8)\}$

- Familiar definite
  - $c[\text{the}^3 \text{ cat IDENT}_8 \text{ jumped}]$

$$= \begin{cases} \# & \text{if for some } a \in c, \\ & \quad |\{x | \mathbf{cat}_{a(0)}(x) \wedge x = a(8)\}| \neq 1 \\ & \quad (\text{i.e., } \neg \mathbf{cat}_{a(0)}(a(8))) \\ c[\mathbf{cat}(3)][3 = 8][\mathbf{jumped}(3)] & \text{otherwise} \end{cases}$$

- Bridging definites are analyzed in an analogous way with a free variable, but let's omit them to avoid complications that arrise with free relations R

Remarks

- Indefinite and definite noun phrases assert the same thing (as in Heim 1982)
- Both definite and indefinite noun phrases are associated with new variables
    - These new variables are eliminable by moving to a stack-based setup, instead of assignments (cf. Van Eijck 2001, Nouwen 2003, 2007)
    - Familiar and bridging definites involve old variables (naturally!)
- For Heim 1982, definites are associated with old variables and do not trigger uniqueness presuppositions (but familiarity presuppositions)
    - For her, familiarirty is the core meaning
    - For us, uniqueness is the core meaning

2.2 Wide scope via presupposition projection

Adding specific indefinites

Proposal: Specific indefinites presuppose existence

To understand what this means, recall first that anaphoric meaning cannot be reduced to propositional meaning (Karttunen 1976, Heim 1982, Sudo 2023)

```
(1)  a. One of my marbles is missing. It must be under the sofa.
     b. I've found nine of my ten marbles. #It must be under the
        sofa.
```

To capture this, Heim's 1982 File Change Semantics operates on two types of model theoretical objects: possible worlds and assingment functions $f : \mathbb{N} \to \mathcal{D}$

Dynamic presuppositions

- For Heim 1982, presuppositions are static propositions that need to be commonly known to be true, i.e., they require all possible worlds in c to satisfy some condition
- I propose in addition that presuppostions may carry new anaphoric information (**dynamic presuppositions**) (Beaver 1992, Elliott & Sudo 2021, Mayr & Sudo 2020)

(1) a. Daniel doesn't know that a philosopher was in the audience, although he clearly saw her.
b. #Daniel doubts that a philosopher was in the audience, although he clearly saw her. (Elliott & Sudo 2021)

Dynamic presuppositions

Notation: $c(i) = \{a(i) | a \in c\}$; $c(0)$ = the set of all possible worlds in c

- Heimian presupposition

$$c[\phi_\pi] = \begin{cases} \# & \text{if } c(0) \neq c[\pi](0) \\ c[\phi] & \text{otherwise} \end{cases}$$

- Dynamic presupposition

$$c[\phi_\pi] = \begin{cases} \# & \text{if } c(0) \neq c[\pi](0) \\ c[\pi][\phi] & \text{otherwise} \end{cases}$$

This change is propositionally inert, but crucially enables dynamic binding from π to ϕ

Cf. Stalnaker's pragmatics of assertion and presuppositions

No consequences for indefinite vs. definite

Notation: $c[\mathbf{uni}(P)] = \{a \in c \mid \exists x[P_{a(0)}(x) \wedge \forall y[P_{a(0)}(y) \rightarrow x = y]]\}$

- $c[\text{a}^3 \text{ cat jumped}]$
  $= \{a \in c \mid \mathbf{cat}_{a(0)}(a(3)) \wedge \mathbf{jumped}_{a(0)}(a(3))\} = c[\mathbf{cat}(3)][\mathbf{jumped}(3)]$
- $c[\text{the}^3 \text{ cat jumped}]$
  $= \begin{cases} \# & \text{if } c(0) \neq c[\mathbf{uni}(\mathbf{cat})](0) \\ c[\mathbf{uni}(\mathbf{cat})][\mathbf{cat}(3)][\mathbf{jumped}(3)] & \text{otherwise} \end{cases}$
- $c[\text{the}^3 \text{ cat IDENT}_8 \text{ jumped}]$
  $= \begin{cases} \# & \text{if } c(0) \neq c[\mathbf{uni}(\mathbf{cat} \wedge =_8)](0) \\ c[\mathbf{uni}(\mathbf{cat} \wedge =_8)][\mathbf{cat}(3)][3 = 8][\mathbf{jumped}(3)] & \text{otherwise} \end{cases}$

Specific indefinites with existence presupposition

- Plain indefinite
  - $c[\text{a}^3 \text{ cat jumped}]$
    $= \{a \in c \mid \mathbf{cat}_{a(0)}(a(3)) \wedge \mathbf{jumped}_{a(0)}(a(3))\} = c[\mathbf{cat}(3)][\mathbf{jumped}(3)]$
- Specific indefinite
  - $c[\text{a}^3_{\text{sp}} \text{ cat jumped}]$
    $= \begin{cases} \# & \text{if } c(0) \neq c[\mathbf{cat}(3)](0) \\ c[\mathbf{cat}(3)][\mathbf{cat}(3)][\mathbf{jumped}(3)] & \text{otherwise} \end{cases}$
  - The pragmatic presupposition is simply existential and propositional
  - In a simple positive sentence like this, there is no effect in the assertion

Wide scope via presupp projection: negation

Negation

$$c[\mathbf{not}(\phi_\pi)]] = \begin{cases} \# & \text{if } c[\phi_\pi] = \# \\ & (\text{i.e., } c(0) \neq c[\pi](0)) \\ \{a \in c[\pi] | \neg \exists b \in c[\pi][\phi]\ a(0) = b(0)\} & \text{otherwise} \end{cases}$$

$c[\mathbf{not}(\mathsf{a}^3_{\mathrm{sp}}\ \mathsf{cat\ jumped})]$

$$= \begin{cases} \# & \text{if } c(0) \neq c[\mathbf{cat}(3)](0) \\ \{a \in c[\mathbf{cat}(3)] \mid \neg \exists b \in c[\mathbf{cat}(3)][\mathbf{cat}(3) \wedge \mathbf{jumped}(3)]\ a(0) = b(0)\} & \\ & \text{otherwise} \end{cases}$$

Wide scope via presupp projection: quantifiers

Explaining (selective) quantifiers will take a lot of time, so let's talk about projection through quantifiers schematically

> (1) Every boy watched $\text{a}_{\text{sp}}{}^{5}$ French film.

- The existence presupposition: $\mathbf{FrenchFilm}(5)$
- Since the presupposition is independent of "every boy", it will simply porject out (cf. *Every boy knows that Mary has quit smoking*)
- The assertive component essentially says: $c[\mathbf{FrenchFilm}(5)][\mathbf{EveryBoy}(\mathbf{FrenchFilm}(5) \wedge \mathbf{Watched}(5))]$.
  - In the scope of "every boy", 5 is an old variable

2.3 Intermediate scope readings

Intermediate scope readings

Fodor & Sag 1982 claimed that wide scope indefinites always take maximal scope, and there is no intermediate scope readings, based on examples like:

> (1) a. Each teacher overheard the rumor that a student of mine had been called before the dean.
>
> b. Each teacher thinks that for a student I know to be called before the dean would be preposterous.
>
> (Fodor & SAg 1982: 374)

Intermediate scope readings (cont.)

But other examples have intermediate scope readings.

(1) a. Every teacher overheard the rumor that a student of his had been called before the dean. (Kratzer 1998: 166)

b. Every professor rewarded every student who read a book he had recommended. (Abushch 1993: 90)

- Note the bound pronouns!!
- It has been remarked that bound pronouns 'facilitate' intermediate scope readings

Quantificational subordination across dimensions

> (1) Every teacher overheard the rumor that a student of his had been called before the dean. (Kratzer 1998: 166)

- Presuppositions project through quantifiers universally, cf. *Every boy quit smoking*
- The existence presupposition of (1a): Every teacher has a^5 student of his
- The assertion of (1a): c[Every teacher has a^5 student of his][Every teacher overheard the rumor that he$_5$, a student of his, had been called before the dean]
  - As before, the index of the indefinite in the latter update is old
  - This time, it's resolved via **quantificational subordination**
    e.g. *Every teacher wrote an abstract. Every teacher sent **it** to SALT.*

Intermediate scope readings w/o bound pronouns

(1) a. Each student has to come up with three arguments which show that some condition proposed by Chomsky is wrong.
b. Everybody told several stories that involved some member of the Royal family. (Farkas 1981: 64)

(2) a. Each professor had a dream that a famous football player ran for President. (King 1988: 434)
b. Every gambler will be surprised if one horse wins. (Abusch 1993: 94)
c. Every country's security will be threatened if some building is attacked by terrorists. (Winter 1997: 431)

Intermediate scope with negation

For some cases, it might not be too far-fetched to postulate a covert relational variable with an old index (e.g., "R y") but for all

Furthermore:

> (1) John wasn't examined by every professor who is competent on some problem. (Ruys & Spector 2017: 32)

There's no way to analyse this in terms of quantificational subordination

A possible solution

One possible solution is **(intermediate) presupposition accommodation**

- Some argue intermediate presupposition accommodation to be possible in some cases (e.g., Van der Sandt 1992, Geurts 1999, Beaver & Zeevat 2007)

More research needed to see if the availability of intermediate scope readings correlates with the availability of (intermediate) presupposition accommodation, as predicted by this analysis

Concluding remarks

Summary

A neo-Heimian dynamic semantics for (in)definiteness

- All indefinite and definite noun phrases are associated with new variables (= they function like existential quantifiers)
- They differences are in the presuppositions
- Dynamic presuppositions allow for a new type of indefinites with existence presuppositions ('specific indefinites')

Morphosyntactic variation

	definite	**specific indefinite**	**plain indefinite**
presupposition	unique	existence	none

English articles	the	a/some	
Turkish objects	X	accusative	no case (nominative)
Japanese nouns	X	bare nouns	

- Note the ambiguity analysis of specificity; this is inevitable in a framework where each LF has a unique meaning