

## Licensing Condition on *any*

### Any

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[bit.ly/uclaslides](http://bit.ly/uclaslides)

- (1) a. Every boy [who read any book] passed.  
b. #Every boy who passed [read any book].
- (2) a. Everyone [who read a book] passed.  
b.  $\Rightarrow$  Everyone [who read a book twice] passed.
- (3) a. Everyone who passed [read a book].  
b.  $\nRightarrow$  Everyone who passed [read a book twice].

### Licensing Condition

*Any* is licensed iff it occurs in a downward-monotone environment.<sup>1</sup>

(Ladusaw 1979)

<sup>1</sup>A constituent  $\alpha$  constitutes a downward-monotone environment wrt a constituent  $\beta$  that dominates it iff replacing  $\alpha$  with an  $\alpha'$  st  $[[\alpha'] \Rightarrow [\alpha]]$  weakens the meaning of  $\beta$ ,  $[[\beta] \Rightarrow [[\beta[\alpha/\alpha']]]$ . See Homer 2010, Gajewski 2011 for discussion and motivation of this formulation.

1/54

2/54

### Problems

Strength

Free Choice

Exactly

Desire

Explanation

### Problem of Free Choice

- (4) You are allowed to read any book.
- (5) Dogs bark at anything.
- (6) Take any fruit.
- (7) #You must read any book.

Existential modals are not downward-monotone

- (8) a. You are allowed to [read a book].  
b.  $\nRightarrow$  You are allowed to [read a book twice].

(e.g., Horn 1972, Hintikka 1977, Ladusaw 1979, Dayal 1998, Aloni 2007b)

3/54

4/54

## Problem of Exactly

(9) Out of my twelve students, exactly two students [read any book].

(10) #Out of my twelve students, exactly ten students [read any book].

*Exactly* quantifiers are not downward-monotone

- (11) a. Exactly two students [read a book].  
b.  $\nRightarrow$  Exactly two students [read a book twice].

(cf. Linebarger 1987, Rothschild 2006)

5/54

## Problem of Desire

(12) So many tasks piled up over the last few months! –  
I hope that [I will read any book this summer].

(13) #I hope that [I will get through any of my slides].

(14) #I think that [I will read any book this summer].

Desire predicates are not downward-monotone

- (15) a. I hope that [I will read a book].  
b.  $\nRightarrow$  I hope that [I will read a book twice].

(cf. Linebarger 1987, Giannakidou 1999)

6/54

## Problems at a glance

### Free Choice

- Non-downward-monotone environment
- Free choice inference
- Existential vs. universal modals

### Exactly, Desire

- Non-downward-monotone environments
- Variability (contextual support)

7/54

## Goals (for today)

- Provide an adequate **description** of the distribution of *any*.
  - We do this in two steps. After the first step, we will have captured Free Choice. After the second step, we will have captured also Exactly and Desire.
  - We build on the insights of Fauconnier (1975), Kadmon & Landman (1993).
- Provide an **explanation** of the distribution of *any*.
  - We show that the description follows if we adapt Lahiri's (1998) account of Hindi Negative Polarity Items to English *any* (cf. Krifka 1995).
  - The resulting account is uniform, compositional, and predictive.
- Study the **variation** in the behavior of polarity items, to which *any* belongs.

8/54

## Modified Licensing Condition on *any*

Problems

Strength

Free Choice

Exactly

Desire

Explanation

### Maximal Strength

*Any NP* is licensed iff it occurs in a constituent whose meaning is logically stronger than that of the alternatives to the constituent induced by *any NP*.

(cf. Fauconnier 1975, Kadmon & Landman 1993)

### Alternatives

*Any NP* is an existential quantifier and its alternatives are existential quantifiers whose domains are subsets of the domain of *any*.

$$(16) \quad \llbracket \text{any book} \rrbracket = \llbracket \text{a book} \rrbracket$$

$$(17) \quad \text{ALT}(\text{any book}) = \{\text{an NP} \mid \text{NP} \subset \text{book}\} \\ = \{\text{a long book, a book with no pictures, etc.}\}$$

(cf. Krifka 1995, Chierchia 2013)

9/54

10/54

## Upward-monotone environments

(18) #John read any book.

$$(19) \quad \text{ALT}(\text{John read any book}) = \{\text{John read an NP} \mid \text{NP} \subset \text{book}\} \\ = \{\text{John read a long book, John read a book without pictures, etc.}\}$$

(20) For every  $\text{NP} \subset \text{book}$ : John read an NP  $\Rightarrow$  John read a book.

### Maximal Strength

For every  $\text{NP} \subset \text{book}$ : John read a book  $\Rightarrow$  John read an NP

X

## Downward-monotone environments

(21) John didn't read any book.

$$(22) \quad \text{ALT}(\text{John didn't read any book}) = \{\neg(\text{John read an NP}) \mid \text{NP} \subset \text{book}\} \\ = \{\neg(\text{John read a long book}), \neg(\text{John read a 400-page book}), \text{etc.}\}$$

### Maximal Strength

For every  $\text{NP} \subset \text{book}$ :  $\neg(\text{John read a book}) \Rightarrow \neg(\text{John read an NP})$

✓

11/54

12/54

## Problem of Free Choice

### Existential modals

(23) You are allowed to read any book.

### Generics and imperatives

(24) Dogs bark at anything.

(25) Take any fruit.

### Universal modals

(26) #You must read any book.

(e.g., Horn 1972, Hintikka 1977, Ladusaw 1979, Dayal 1998, Aloni 2007b)

13/54

14/54

## Problem of Free Choice

Modals are upward-monotone operators

- (27) a. You are allowed to read a book twice.  
 b.  $\Rightarrow$  You are allowed to read a book.

The distribution of *any* is unexpected in their scope

- (28) a. You are allowed to read any book.  
 b.  $\diamond$ (you read a book)

### Maximal Strength

For every  $NP \sqsubseteq \text{book}$ :  $\diamond$ (you read a book)  $\Rightarrow$   $\diamond$ (you read an NP)

X

## Inferential patterns

- (29) a. You are allowed to read any book.  
 b.  $\Rightarrow$  You are allowed to read any {recent/long/etc.} book.

- (30) a. Dogs bark at anything.  
 b.  $\Rightarrow$  Dogs bark at any {furry/squirrely/etc.} thing.

- (31) a. Take any fruit.  
 b.  $\leftrightarrow$  Take any {big/small/etc.} fruit.

15/54

16/54

## Free choice inferences

Any and disjunction induce free choice inferences:

- (32) You are allowed to read any book.  
(33) You are allowed to read Purity or Freedom.  
(34) a.  $\Rightarrow$  You are allowed to read Purity.  
b.  $\Rightarrow$  You are allowed to read Freedom.  
(35) Dogs bark at anything.  
(36) Dogs bark at cats or squirrels.  
(37) a.  $\Rightarrow$  Dogs bark at cats.  
b.  $\Rightarrow$  Dogs bark at squirrels.

17/54

## Existential quantification in generics and imperatives

### Gn as an existential operator

- (41) It is false that dogs bark. (cf. von Stechow 1997, Löbner 2000)  
(42) a. Where can I get gas? mention-some reading  $\checkmark$   
b. Where should I get gas? mention-some reading  $\#$   
c. What do dogs bark at? mention-some reading  $\checkmark$

### Imp as an existential operator

- (43) Go ahead, take a fruit, if you like.  
(44) Mirno {lahko greš / #moraš iti / pojdi} domov. [Slovenian]  
freely may go / must go / go-imp home  
(e.g., Grosz 2011, Kaufmann 2011)

19/54

## Derivation

### Free choice meaning

- (38) a. You are allowed to read any book.  
b. [STR [ $\diamond$  [ you read any book ]]]  
(e.g., Klinedinst 2007, Fox 2007, Chemla 2008, Franke 2011, Chierchia 2013)  
(39)  $\diamond(\text{you read Purity}) \wedge \diamond(\text{you read Freedom})$   
(40) (every book<sub>x</sub>:  $\diamond(\text{you read } x)$ )

### Maximal Strength

For all  $\text{NP} \subseteq \text{book}$ : (every book<sub>x</sub>:  $\diamond(\text{you read } x)$ )  $\Rightarrow$  (every NP<sub>x</sub>:  $\diamond(\text{you read } x)$ )

18/54

## Universal quantification in generics and imperatives

### Universal quantificational force via STR

- (45) a. Take a fruit!  
b. [STR [ Imp<sub>Acc</sub> [ you take a fruit ]]]  
(46) a. Without STR: (some w in Acc: you take a fruit in w)  
b. With STR: (every w in Acc: you take a fruit in w)

(See Kaufmann 2011, Oikonomou 2016 for imperatives; Singh et al. 2013, Bowler 2014, Bar-Lev & Margulis 2014, Bassi & Bar-Lev 2016, Wong 2017 for other types of existential quantifiers and disjunction.)

20/54

## Subtriggering and genericity

Any may be felicitous when it is apparently unembedded

- (47) a. Mary confidently answered any objections. (Dayal 1998)  
 b. John talked to any woman #(at the party).

(see also LeGrand 1975, Jayez & Tovena 2005, Aloni 2007a, i.a.)

With the universal construal, we get the following inferences:

- (48) a. Mary confidently answered any objections.  
 b.  $\Rightarrow$  Mary confidently answered any {difficult, inane, etc.} objections.

Generic analysis of subtriggering

- (49) a. Mary confidently answered any objections.  
 b. [STR [G<sub>dom</sub> [Mary answered any objections]]]

21/54

## Intermediate summary

- Maximal Strength predicts that *any* is acceptable in existential modal sentences – but only if free choice inferences are triggered.
- We had to assume that generics and imperatives involve underlying existential quantification. This is independently supported.
- We pointed out that the universal interpretation of generic/imperative sentences can be derived by the same means deriving free choice inferences.
- We hinted at how the cases of subtriggering may be handled on this approach to free choice, namely, as involving underlying generic quantification.

22/54

## Universal modals and free choice inference

Free choice is possible with universal modals

- (50) John must read Purity or Freedom.  
 (51) a.  $\Rightarrow$  John may read Purity.  
 b.  $\Rightarrow$  John may read Freedom.

However, we get different inferences than with existential modals:

- (52) a. John must read a book and he may read any book.  
 b.  $\nRightarrow$  John must read a long book and he may read any long book.

## Derivation

### Free choice meaning

- (53) a. #You must read any book.  
 b. [STR [ $\square$  [ John read any book ]]]

(54)  $\square(\text{you read a book}) \wedge \diamond(\text{you read Purity}) \wedge \diamond(\text{you read Freedom})$

(55)  $\square(\text{John read a book}) \wedge (\text{every book}_x: \diamond(\text{you read } x))$

### Maximal Strength

For  $\text{NP} \sqsubseteq \text{book}$ :  $\square(\text{John read a book}) \wedge (\text{every book}_x: \diamond(\text{you read } x))$   
 $\Rightarrow \square(\text{John read an NP}) \wedge (\text{every NP}_x: \diamond(\text{you read } x))$

X

23/54

24/54

## Summary

### Problem of Free Choice

- Once free choice inferences of *any NP* are factored in, by the means of STR, the distribution of *any NP* is correctly described by Maximal Strength:
  - *Any* is acceptable in existential modal, generic, or imperative environments
  - *Any* is not acceptable in universal modal environments

### Where are we at?

- A shift from Ladusaw's Licensing Condition to Maximal Strength did not affect the predictions about *any* in (i) plain upward-monotone and (ii) downward-monotone environments. In addition, it correctly delivered the distribution of *any* in (iii) modal environments (Problem of Free Choice).

25/54

### Problem of Exactly

(56) Out of my twelve students, exactly two students [read any book].

(57) #Out of my twelve students, exactly ten students [read any book].

#### Maximal Strength



For every  $NP \subseteq \text{book}$ : exactly  $n$  st's read a book  $\Rightarrow$  exactly  $n$  st's read an NP

27/54

Problems

Strength

Free Choice

Exactly

Desire

Explanation

26/54

### Modified Licensing Condition on *any* (final)

#### Maximal Strength

*Any NP* is licensed iff it occurs in a constituent whose meaning is **logically stronger** than that of the alternatives to the constituent induced by *any NP*.

We must relax the ordering relation on alternatives in such a way that

- the predictions about *any* in plain upward-monotone, in downward-monotone, and in modal environments are left unaffected,
- acceptable occurrences of *any* in non-monotone environments are admitted, and unacceptable occurrences are ruled out.

#### (Maximal Strength) Minimal Likelihood

*Any NP* is licensed iff it occurs in a constituent whose meaning is ~~log- stronger~~ **less likely** than that of the alternatives to the constituent induced by *any NP*.

28/54

## Modified Licensing Condition on *any* (final)

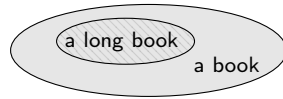
### Minimal Likelihood

*Any NP* is licensed iff it occurs in a constituent whose meaning is less likely than that of the alternatives to the constituent induced by *any NP*.

### Entailment and likelihood (roughly)

(58) John read a long book  $\Rightarrow$  John read a book

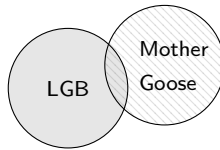
(59) John read a long book  $<_c$  John read a book



### Logical independence and likelihood

(60) John read LGB  $\nRightarrow$  John read Mother Goose

(61) John read LGB  $<_c$  John read Mother Goose



29/54

## Monotone environments

### Upward-monotone environments

(62) #John read any book.

(63) For every  $NP \subseteq \text{book}$ : John read an NP  $\Rightarrow$  John read a book

### Minimal Likelihood

For every  $NP \subseteq \text{book}$ : John read a book  $<_c$  John read an NP

X

### Downward-monotone environments

(64) John didn't read any book.

(65) For every  $NP \subseteq \text{book}$ :  $\neg(\text{John read a book}) \Rightarrow \neg(\text{John read an NP})$

### Minimal Likelihood

For every  $NP \subseteq \text{book}$ :  $\neg(\text{John read a book}) <_c \neg(\text{John read an NP})$

✓

30/54

## Non-monotone environments

(66) Out of my 12 students, exactly 2 students read any book.

### Minimal Likelihood

For every  $NP \subseteq \text{book}$ : exactly 2 st's read a book  $<_c$  exactly 2 st's read an NP

?

(67) #Out of my 12 students, exactly 10 students read any book.

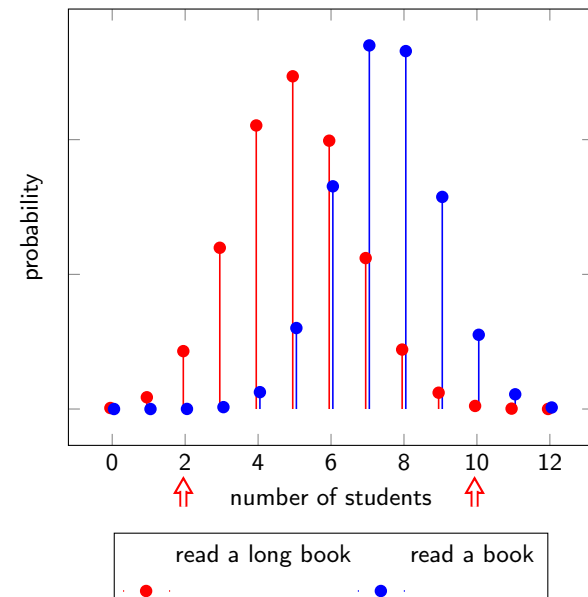
### Minimal Likelihood

For every  $NP \subseteq \text{book}$ : exactly 10 st's read a book  $<_c$  exactly 10 st's read an NP

?

31/54

## Cursory representation of shared expectations



32/54



## Non-monotone environments

(68) Out of my 12 students, exactly 2 students read any book.

### Minimal Likelihood ✓

For every  $NP \subseteq \text{book}$ : exactly 2 st's read a book  $<_c$  exactly 2 st's read an NP

(69) #Out of my 12 students, exactly 10 students read any book.

### Minimal Likelihood ✗

For every  $NP \subseteq \text{book}$ : exactly 10 st's read a book  $<_c$  exactly 10 st's read an NP

33/54

## Summary

- We modified the licensing condition by replacing entailment with likelihood:
  - Upward-monotone environments: *any* is unacceptable
  - Downward-monotone environments: *any* is acceptable
  - Non-monotone environments: *any* may be acceptable
- If *any* occurs in the scope of a non-monotone quantifier, Minimal Likelihood is satisfied only in certain contexts (where fitting assumptions are shared).
- The analysis may provide some insight into the gradation of acceptability judgments (and individual variability) reported with respect to sentences containing polarity items (Chemla et al. 2011) – namely, these effects may be due to differences in individuals' assumptions about the context.

34/54

## Problem of Desire

(70) So many tasks piled up over the last few months! –  
I hope that [I will read any book this summer].

(71) #I hope that [I will get through any of my slides].

(72) #I think that [I will read any book this summer].

Desire predicates are not downward-monotone

- (73) a. I hope that [I will read a book].  
b.  $\nRightarrow$  I hope that [I will read a book twice].

(cf. Linebarger 1987, Giannakidou 1999)

35/54

36/54

Problems

Strength

Free Choice

Exactly

Desire

Explanation

## Desire attitudes are non-monotone

- (74) a. I want to teach Tuesdays and Thursdays next semester.  
 b.  $\nRightarrow$  I want to teach next semester.
- (75) a. Sue hopes that Jane took the 101 early in the morning.  
 b.  $\nRightarrow$  Sue hopes that Jane took the 101.
- (76) a. I think that I teach Tuesdays and Thursdays next semester.  
 b.  $\Rightarrow$  I think that I teach next semester.

(e.g., Asher 1987, Heim 1992, von Fintel 1999, Villalta 2008)

37/54

## Another argument for non-monotonicity

Positive polarity items

- (77) John has already talked to someone.  
 (78) #John hasn't already talked to someone.

Rescuing of positive polarity items

- (79) a. ?Exactly one person hasn't already talked to someone.  
 b. I doubt that John hasn't already talked to someone.

(esp. Szabolcsi 2004)

- (80) a. I hope that John hasn't already talked to someone. (Baker 1970)  
 b. #I think that John hasn't already talked to someone.

38/54

## Derivation

- (81) I hope that I will read any book.
- (82) a. Presupposition:  $\Diamond_{Ep(sp)}(\neg I \text{ read a book})$   
 b. Assertion:  $\Box_{Des(sp)}(I \text{ read a book})$  (von Fintel 1999)

### Maximal Strength ?

For every  $NP \subset \text{book}$ :  $\Diamond_{Ep(sp)}(\neg I \text{ read a book}) \wedge \Box_{Des(sp)}(I \text{ read a book}) <_c$   
 $\Diamond_{Ep(sp)}(\neg I \text{ read an NP}) \wedge \Box_{Des(sp)}(I \text{ read an NP})$

39/54

## Belief attitudes

- (83) #I think that I will read any book.
- (84) Assertion:  $\Box_{Bel(sp)}(I \text{ read a book})$
- (85) For every  $NP \subset \text{book}$ :  $\Box_{Bel(sp)}(I \text{ read an NP}) \Rightarrow \Box_{Bel(sp)}(I \text{ read a book})$
- (86) For every  $NP \subset \text{book}$ :  $\Box_{Bel(sp)}(I \text{ read an NP}) \leq_c \Box_{Bel(sp)}(I \text{ read a book})$

### Minimal Likelihood X

For every  $NP \subset \text{book}$ :  $\Box_{Bel(sp)}(I \text{ read a book}) <_c \Box_{Bel(sp)}(I \text{ read an NP})$

40/54

## Negated desire attitudes

(87) I didn't hope that I will read any book.

- (88) a. Presupposition:  $\Diamond_{Ep(sp)}(\neg I \text{ read a book})$   
b. Assertion:  $\neg \Box_{Des(sp)}(I \text{ read a book})$

### Minimal Likelihood



For  $NP \subseteq \text{book}$ :  $\neg \Box_{Des(sp)}(I \text{ read a book}) <_c \neg \Box_{Des(sp)}(I \text{ read an NP})$

41/54

## Summary

- If *any* occurs in the scope of Desire predicates, Minimal Likelihood can be satisfied if appropriate assumptions obtain in the context.
- We proposed that the non-monotonicity with desire predicates springs from accommodating their presuppositions. The difference between desire and belief predicates in licensing *any* stems from their different presuppositions.
- We suggested that the distribution of *any* in negated desire statements provides support for assigning desire predicates monotone assertive meanings.

42/54

## Description

### Minimal Likelihood

*Any NP* is licensed iff *any NP* occurs in a constituent whose meaning is less likely than that of the alternatives to the constituent induced by *any NP*.

### Alternatives

*Any NP* is an existential quantifier and its alternatives are existential quantifiers whose domains are subsets of the domain of *any*.

- Upward-monotone environments: *any* is unacceptable
- Downward-monotone environments: *any* is acceptable
- Non-monotone environments: *any* may be acceptable

43/54

44/54

Problems

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Free Choice

Exactly

Desire

Explanation

## Hindi Negative Polarity Items

- (89) #ek bhii aadmii aayaa  
one even man arrived  
'#Anyone arrived.'
- (90) ek bhii aadmii nahiiN aayaa  
one even man not came  
'No one arrived.'
- (91) tum kabhii bhii ghar jaa sakte ho  
you sometime even home go may  
'You may go home at anytime.'

(Lahiri 1998)

45/54

## Hindi Negative Polarity Items

### Mobile even component

- (92)  $\llbracket \text{even} \rrbracket(x)(P)$  is defined only if  $\forall y \neq x: P(x) \neq P(y) \rightarrow P(x) <_c P(y)$ .
- (93) a. Even John arrived.  
b.  $\llbracket \text{even John} \rrbracket [\lambda x [x \text{ arrived}]]$
- (94) Presupposition:  $\forall x \neq \text{John}: (\text{John arrived}) <_c (x \text{ arrived})$

### Weak indefinite component

- (95) a. ek = one  
b.  $\text{ALT}(ek) = \{\text{two, three, four, etc.}\}$
- (96) a.  $\llbracket \text{ek bhii aadmii} \rrbracket$   
b.  $\llbracket \llbracket \text{even one} \rrbracket \text{ many} \rrbracket \text{ man}$

(e.g., Hackl 2000, Solt 2015, Rett 2016 on *many*)

46/54

## Hindi Negative Polarity Items

### Upward-monotone environments

- (97) a. #ek bhii aadmii bhii ayaa  
one even man arrived  
b.  $\llbracket \text{even one} \rrbracket [\lambda d \llbracket \llbracket \text{d-many man} \rrbracket \text{ arrived} \rrbracket]$
- (98) Presupposition:  $\# \forall n > 1: (\text{one man arrived}) <_c (n \text{ men arrived})$

### Downward-monotone environments

- (99) a. ek bhii aadmii nahiiN aayaa  
one even man not arrived  
b.  $\llbracket \text{even one} \rrbracket [\lambda d \llbracket \text{neg} \llbracket \llbracket \text{d-many man} \rrbracket \text{ arrived} \rrbracket \rrbracket]$
- (100) Presupposition:  $\forall n > 1: \neg(\text{one man arrived}) <_c \neg(n \text{ men arrived})$

47/54

## Explanation

The domain of *any* is an associate of (covert) *even*

- (101)  $\llbracket \text{even} \rrbracket(D)(P)$  is defined only if  $\forall D' \subset D: P(D) \neq P(D') \rightarrow P(D) <_c P(D')$ .
- (102) a.  $\llbracket \text{any book} \rrbracket$   
b.  $\llbracket \llbracket \text{any} \rrbracket \llbracket \text{even D} \rrbracket \rrbracket \text{ book}$

### Downward-monotone environments

- (103) a. John didn't read any book.  
b.  $\llbracket \text{even D} \rrbracket [\lambda D' \llbracket \text{neg} \llbracket \text{John read} \llbracket \llbracket \text{any D}' \rrbracket \text{ book} \rrbracket \rrbracket \rrbracket]$
- (104) Presupposition:  
 $\forall D' \subset D: \neg(\text{John read a book in } D) \neq \neg(\text{John read a book in } D')$   
 $\rightarrow \neg(\text{John read a book in } D) <_c \neg(\text{John read a book in } D')$

(cf. Krifka 1995, Lahiri 1998)

48/54

## Explanation

### Existential modal environments

(105) John is allowed to read any book.

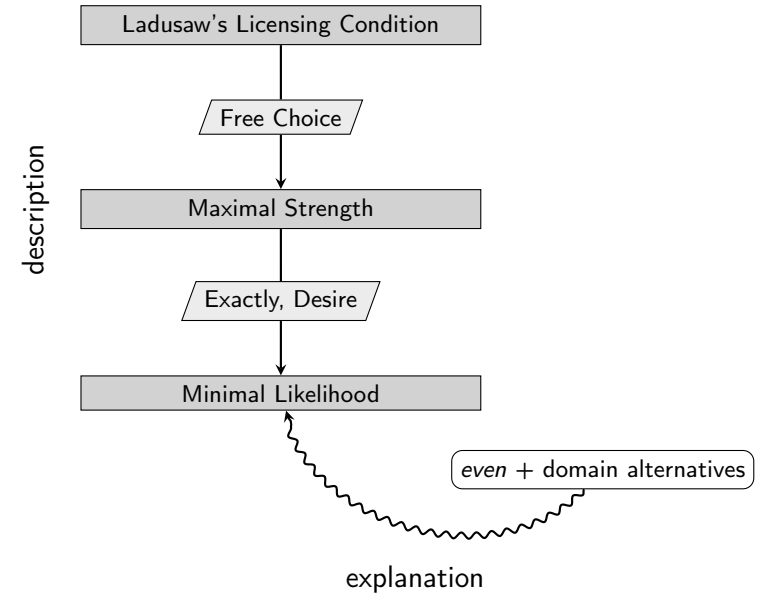
(106) [even D] [ $\lambda D'$  [STR [ $\diamond$  [John read [[any D'] book]]]]]]

(107)  $\forall D' \subset D: (\text{every bk-in-}D_x: \diamond(\text{you read } x)) \neq (\text{every bk-in-}D'_x: \diamond(\text{you read } x))$   
 $\rightarrow (\text{every bk-in-}D_x: \diamond(\text{you read } x)) <_c (\text{every bk-in-}D'_x: \diamond(\text{you read } x))$

Ellipsis provides further support for this configuration (Crnič 2017)

(108) a. John is allowed to read any book. Mary is too.  
 b. John is allowed to read any book. #Mary has to/already did.

(109) John didn't read any book. But he was allowed to – except for *Lolita*!



49/54

50/54

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51/54

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52/54

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