Indefinites in comparatives

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Indefinites in comparatives

- **Goal**: explain distribution and meaning of indefinites in comparatives
- Focus on English *any* and *some*, and German *irgend*-indefinites:

(1) a. John is taller than (almost) any girl. [universal meaning]
b. John is taller than some girl. [existential meaning]
c. John is taller than IRGENDEIN girl. [universal meaning]

- Two observations:
  - *Any* in comparatives is free choice rather than NPI (Heim 2006)
  - *Irgend*-indefinites must be stressed to have universal meaning in comparatives (Haspelmath 1997)
- Three puzzles:
  1. FC-*any* licensed in comparatives;
  2. The case of stressed *irgend*-indefinites in comparatives;
  3. Differences in quantificational force.

First puzzle: FC-*any* in comparatives

- Restricted distribution of FC-*any*:

(2) a. Any girl may fall.
b. #Any girl fell.
c. Any girl who tried to jump fell. [subtrigging]

- Various explanations for (2):
  - Universalist account: Dayal (1998)
  - Modal account: Giannakidou (2001)
  - Non individuation: Jayez & Tovena (2005)
  - Implicature account: Chierchia (2010)
  - Alternative semantics: Menèndez-Benito (2005)/Aloni (2007)
  - ...
- Can any of these be extended to the case of comparatives?

(3) John is taller than any girl.

Second puzzle: *irgend*-indefinites [K&S 2002, Port 2010]

- When unstressed, *irgend*- has a free distribution, and in positive contexts a meaning similar to English *some*:

(4) Irgend jemand hat angerufen. #Rat mal wer?
irgend somebody has called guess prt who?
'Somebody called – speaker doesn't know who' [Haspelmath 1997]

- When stressed, it has meaning and distribution similar to *any*:

(5) Dieses Problem kann IRGEND JEMAND lösen.
'This problem can be solved by anyone' [Haspelmath 1997]

(6) Joan Baez sang besser als IRGEND JEMAND JE zuvor.
'Joan Baez sang better than anyone ever before' [Haspelmath 97]

- How can this pattern be accounted for? What is the role of stress?

Third puzzle: quantificational force

- Different quantificational force for indefinites in comparatives:

(7)
  a. John is taller than any girl. [universal meaning]
  b. John is taller than some girl. [existential meaning]
  c. John is taller than IRGENDEIN girl. [universal meaning]

- Let's assume indefinites are existentials
- Predictions for indefinites in comparatives:
  - Early theories of comparatives (Seuren/von Stechow/Rullmann):

    ⇒ universal meaning for all sentences in (7)
  - Recent theories (Larson/Schwarzschild&Wilkinson/Heim/Gajewski):

    ⇒ existential meaning for all sentences in (7)

Plan:

- Adopt a more sophisticated analysis for indefinites:

  ↦ alternative semantics [Kratzer & Shimoyama/Menèndez-Benito]
- Discuss three cases:
  1. Alternative semantics + an early theory: Standard Theory
  2. Alternative semantics + a recent theory: Maximality Theory
  3. [Alternative semantics + another recent theory: Exhaustivity Theory]

Alternative semantics for indefinites

MOTIVATION

- Explain variety of indefinites. E.g.
  - English: *a*, *some*, *any*, ...
  - Italian: *un(o)*, *qualche*, *qualsiasi*, *nessuno*, ...
  - German: *ein*, *irgendein*, *welcher*, ...

HOW

- Indefinites ‘introduce’ sets of propositional alternatives;
- These are bound by propositional operators: [∃], [∀], [Neg], [Q];
- Different indefinites associate with different operators.

EXAMPLES

(8) a. [∃] (*someone*/*irgendjemand* fell) [K&S 2002]
b. [Q] (who fell)
c. [Neg] (nessuno fell)
d.

d_1 fell	d_2 fell	...

FREE CHOICE ANY

- FC *any* requires the application of two covert operators:

(9) [∀] ... **exh**(... *any* ...) [Menèndez-Benito 2005]

Free choice *any* in alternative semantics

- The operator **exh** delivers a set of mutually exclusive propositions (let $[\![\alpha]\!] = \{d_1, d_2\}$):

(10) a. $\mathbf{exh}[\alpha, P]$ type: (st)
b. $\{$only d_1 is P, only d_2 is P, only d_1 and d_2 are $P\}$

- Ruling out FC-*any* in episodic contexts:

(11) a. #Any girl fell.
b. $[\forall]$(**exh**[any girl, fell])
c. $[\forall]$

only d_1 fell	only d_2 fell	only d_1 and d_2 fell	...

d. Predicted meaning: $\bot$

- Licensing FC-*any* under $\Diamond$:

(12) a. Any girl may fall.
b. $[\forall]$($\Diamond$(**exh**[any girl, fall]))
c. $[\forall]$

$\Diamond$ only d_1 falls	$\Diamond$ only d_2 falls	$\Diamond$ only d_1 and d_2 fall	...

d. Predicted meaning: universal free choice

Comparatives: two theories

1. **S-theory:** (Seuren/vStechow/Rullman)
   - Gradable adjectives are monotone functions of type $e(dt)$:

     (13) a. John is taller than Mary.
     b. λd. John is d tall $\supset \lambda d$. Mary is d tall

   - Universal meanings for existentials in *than*-clauses
   - Problem: quantifiers must scope out of the *than*-clause
2. **M-theory:** (Schwarzschild & Wilkinson/Heim) [cf. Gajewski 09]
   - Places a scope-taking operator (negation) within the *than*-clause:

     (14) a. John is taller than Mary.
     b. $max(\lambda d$. John is d tall$) \in \lambda d$. Mary is **not** d tall

   - Existential meanings for existentials in *than*-clauses
   - Problems only with DE quantifiers

- NEXT: implementation in alternative semantics

S-theory: basic example

The comparative morpheme, **more**, takes two 'intensional' degree properties, of type $d(st)$, and delivers a proposition, of type (st)

(15) $[\![\textbf{more}^S]\!] = \lambda Q_{d(st)}.\lambda P_{d(st)}.\lambda w.[\lambda d.P(d,w) \supset \lambda d.Q(d,w)]$

(16) a. John is taller than Mary.

b. $[\textbf{more}^S\ [\lambda d.\lambda w.T(m,d,w)]]\ [\lambda d.\lambda w.T(j,d,w)]$

c. $\{\lambda w.[\lambda d.\text{ John is } d \text{ tall in } w \supset \lambda d.\text{ Mary is } d \text{ tall in } w]\}$

S-theory: *some*

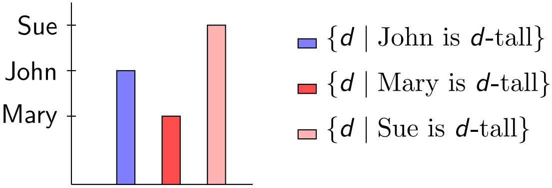
(17) a. John is taller than some girl.

b. $[\exists][\mathbf{more}^S[\lambda d.[\text{some girl}, \lambda x.\lambda w.T_w(x,d)]]]\,[\lambda d.\lambda w.T_w(j,d)]$

c. $[\exists]\{\ \lambda w.[\lambda d.T_w(j,d) \supset \lambda d.T_w(y,d)]\ \mid\ y \text{ is a girl}\}$

d. The set of worlds w such that **at least one** of the following holds:

$\{d \mid \text{John is } d\text{-tall in } w\} \supset \{d \mid \textbf{Mary} \text{ is } d\text{-tall in } w\}$
$\{d \mid \text{John is } d\text{-tall in } w\} \supset \{d \mid \textbf{Sue} \text{ is } d\text{-tall in } w\}$



$\Rightarrow$ for some girl y, John is taller than y

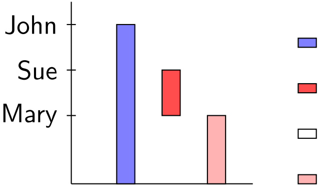
S-theory: *any*

(18) a. John is taller than any girl.

b. $[\forall][\textbf{more}^S[\lambda d.\textbf{exh}[\text{any girl}, \lambda x.\lambda w.T_w(x,d)]]][\lambda d.\lambda w.T_w(j,d)]$

c. The set of worlds w such that **all** of the following hold:

$\{d \mid \text{J is } d\text{-tall in } w\} \supset \{d \mid \textbf{only M} \text{ is } d\text{-tall in } w\}$
$\{d \mid \text{J is } d\text{-tall in } w\} \supset \{d \mid \textbf{only S} \text{ is } d\text{-tall in } w\}$
$\{d \mid \text{J is } d\text{-tall in } w\} \supset \{d \mid \textbf{both S and M} \text{ are } d\text{-tall in } w\}$



$\{d \mid \text{John is } d\text{-tall}\}$

$\{d \mid \textbf{only Sue} \text{ is } d\text{-tall}\}$

$\{d \mid \textbf{only Mary} \text{ is } d\text{-tall}\} = \emptyset$

$\{d \mid \textbf{both Sue and Mary} \text{ are } d\text{-tall}\}$

$\Rightarrow$ for every girl y, John is taller than y

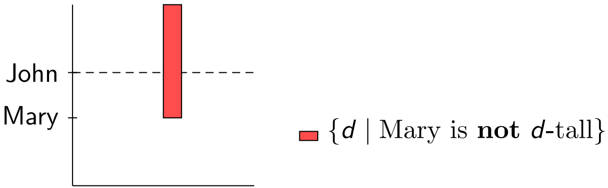
M-theory: basic example

(19) $[\![\textbf{more}^M]\!] = \lambda P_{d(st)}.\lambda Q_{d(st)}.\lambda w.[max(\lambda d.Q(d,w)) \in \lambda d.P(d,w)]$

(20) a. John is taller than Mary.

b. $[\textbf{more}^M[\lambda d.\lambda w.\neg T_w(m,d)]]\,[\lambda d.\lambda w.T_w(j,d)]$

c. $\{\lambda w.[max(\lambda d.$ J is d tall in $w) \in \lambda d.$ M is not d tall in $w\}$



M-theory: *some*

(21)

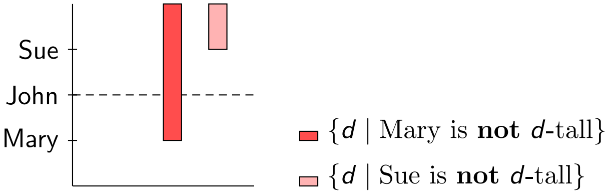
a. John is taller than some girl.

b. $[\exists][\mathbf{more}^M[\lambda d.[\text{some girl}, \lambda x.\lambda w.\neg T_w(x,d)]]]\ [\lambda d.\lambda w.T_w(j,d)]$

c. $[\exists]\{\lambda w.[max(\lambda d.T_w(j,d)) \in (\lambda d.\neg T_w(y,d)) \mid y \in \{\text{Mary, Sue}\}\}$

d. The set of worlds w such that **at least one** of the following holds:

$max\{d \mid \text{John is } d\text{-tall in } w\} \in \{d \mid \textbf{Mary} \text{ is } \textbf{not } d\text{-tall in } w\}$
$max\{d \mid \text{John is } d\text{-tall in } w\} \in \{d \mid \textbf{Sue} \text{ is } \textbf{not } d\text{-tall in } w\}$



$\Rightarrow$ for some girl y, John is taller than y

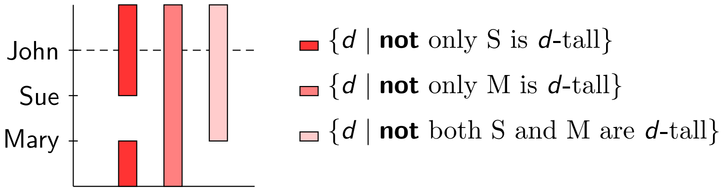
M-theory: *any*

(22) John is taller than any girl.

$[\forall][\textbf{more}^M[\lambda d.\neg\textbf{exh}[\text{any girl}, \lambda x.\lambda w.T_w(x,d)]]][\lambda d.\lambda w.T_w(j,d)]$

The set of worlds w such that **all** of the following hold:

$max\{d \mid \text{J is } d\text{-tall in } w\} \in \{d \mid \textbf{not} \text{ only S is } d\text{-tall in } w\}$
$max\{d \mid \text{J is } d\text{-tall in } w\} \in \{d \mid \textbf{not} \text{ only M is } d\text{-tall in } w\}$
$max\{d \mid \text{J is } d\text{-tall in } w\} \in \{d \mid \textbf{not} \text{ both S and M are } d\text{-tall in } w\}$



$\Rightarrow$ for every girl y, John is taller than y

Crucial assumption: *any* scopes under negation

Summary

- Examples:

(23) a. John is taller than any girl. [universal meaning]
b. John is taller than some girl. [existential meaning]

- Predictions:

(24)

	some	any
S-theory	yes	yes
M-theory	yes	yes

- Crucial assumption M-theory: *any* must scope under negation!
- NEXT: the case of *irgend*-indefinites

Irgend-indefinites: the crucial role of accent

Observation

- In free choice uses and in comparatives, the *irgend*-indefinite must be stressed (Haspelmath 1997):

(25) Dieses Problem kann IRGEND JEMAND lösen.
'This problem can be solved by anyone'

(26) Joan Baez sang besser als IRGEND JEMAND JE zuvor.
'Joan Baez sang better than anyone ever before'

Proposal

- Stress signals focus, and focus has two semantic effects:
  (i) it introduces a set of focus alternatives (Rooth 1985)
  (ii) it flattens the ordinary alternative set (Roelofsen & van Gool 2010)
- Applications:
  - (i) allows us to derive FC inferences of stressed *irgend*-indefinites under modals as obligatory implicatures à la Chierchia 2010
  - (ii) yields an account of stressed *irgend* in comparatives

Two effects of focus

- Focus:
  (i) introduces a set of focus alternatives (Rooth 1985)
  (ii) flattens the ordinary alternative set (Roelofsen & van Gool 2010):

(27) a. If α is of type (st), then $[\![\alpha]\!]$ is a set of propositions, and $[\![\alpha_F]\!] = \{\bigcup[\![\alpha]\!]\}$
b. If α is of type $\sigma \neq (st)$, then $[\![\alpha_F]\!] = \{\lambda z. \bigcup_{y \in [\![\alpha]\!]} z(y)\}$, where z is of type $\sigma(st)$

- Illustration:

(28) Irgendjemand called
a. Alternative set: {Mary called, Sue called, . . . }
b. Focus value: $\emptyset$

(29) Irgendjemand$_F$ called
a. Alternative set: {somebody called} [result of 'flattening']
b. Focus value: {Mary called, Sue called, . . . }

Original motivation: alternative versus polar questions

- Disjunctive questions are ambiguous:

(30) Does Ann or Bill play?

a. Alternative reading: expected answers $\mapsto$ *Ann/Bill*
b. Polar reading: expected answers $\mapsto$ *yes/no*

- Focus plays a disambiguating role:

(31) Does Ann_F or Bill_F play?

a. Alternative set: {Ann plays, Bill plays}
b. Focus set: {Ann plays, Bill plays, ...}
c. $\Rightarrow$ Alternative question meaning

(32) Does $[\text{Ann or Bill}]_F$ play?

a. Alternative set: {Ann or Bill plays} [result of 'flattening']
b. Focus set: {Ann plays, Bill plays, ...}
c. $\Rightarrow$ Polar question meaning

Irgend-indefinites in comparatives

(33) John is taller than IRGENDJEMAND$_F$.

S-theory

(34) $[\exists]\mathbf{more}^S[\lambda d.[\text{irgendjemand}_F, \lambda x.\lambda w.T_w(x,d)]]\,[\lambda d.\lambda w.T_w(j,d)]$

a. $[\exists]\{\lambda w.[\lambda d.T(j,d) \supset \lambda d.\exists x T(x,d)]\}$

b. $\Rightarrow$ for every person x, John is taller than x

M-theory

(35) $[\exists]\mathbf{more}^M[\lambda d.\neg[\text{irgendjemand}_F, \lambda x.\lambda w.T_w(x,d)]]\,[\lambda d.\lambda w.T_w(j,d)]$

a. $[\exists]\{\lambda w.[max(\lambda d.T_w(j,d)) \in (\lambda d.\neg\exists x T_w(x,d))\}$

b. $\Rightarrow$ for every person x, John is taller than x

Crucial assumption: *irgend* scopes under negation

IRGEND versus SOME

(36) a. John is taller than IRGENDJEMAND$_F$. [universal meaning]
b. John is taller than SOMEONE$_F$. [existential meaning]

S-theory

(37) a. John is taller than SOMEONE$_F$.

b. $[\exists]\textbf{more}^S[\lambda d.[\text{someone}_F, \lambda x.\lambda w.T_w(x,d)]]\,[\lambda d.\lambda w.T_w(j,d)]$

c. $[\exists]\{\lambda w.[\lambda d.T(j,d) \supset \lambda d.\exists x T(x,d)]\}$

d. $\Rightarrow$ universal meaning **[wrong!]**

M-theory

(38) a. John is taller than SOMEONE$_F$.

b. $[\exists]\textbf{more}^R[\lambda d.[\text{someone}_F, \lambda x.\lambda w.\neg T_w(x,d)]]\,[\lambda d.\lambda w.T_w(j,d)]$

c. $[\exists]\{\lambda w.[max(\lambda d.T_w(j,d)) \in (\lambda d.\exists x \neg T_w(x,d))\}$

d. $\Rightarrow$ existential meaning **[ok!]**

Crucial assumption: *some* scopes over negation

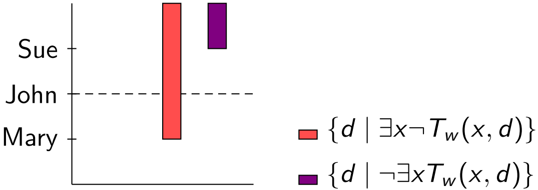
IRGEND versus SOME in the M-theory

(39) a. John is taller than SOMEONE$_F$.

b. $[\exists]\{\lambda w.[max(\lambda d.T_w(j,d)) \in (\lambda d.\exists x \neg T_w(x,d))\}$

(40) a. John is taller than IRGENDJEMAND$_F$.

b. $[\exists]\{\lambda w.[max(\lambda d.T_w(j,d)) \in (\lambda d.\neg\exists x T_w(x,d))\}$



Summary

- Examples:

(41)
a. John is taller than any girl. [universal meaning]
b. John is taller than some girl. [existential meaning]
c. John is taller than IRGENDJEMAND. [universal meaning]
d. John is taller than SOMEONE. [existential meaning]

- Predictions:

(42)

	some	any	IRGEND	SOME
S-theory	yes	yes	yes	no
M-theory	yes	yes	yes	yes

- Crucial assumptions M-theory:

(43) *some* (like ordinary quantifiers) must scope out of negation, *any* and *irgend* must scope under negation.

- Discussion: *some* is a PPI, while *any* and *irgend* are NPIs. But what about genuine FCIs like Italian *qualunque* or Spanish *cualquiera*?

Exhaustivity Theory for Comparatives

- The comparative morpheme **er** is an operator that takes two 'intensional' degrees, of type (sd), and delivers a proposition, of type (st):

(44) $[\![\textbf{er}]\!] = \lambda d_2.\lambda d_1.\lambda w.d_1(w) \geq d_2(w)$

(45) a. John is taller than Mary.
b. $\textbf{er}[\textbf{exh}_e[\lambda d.\lambda w.\neg T_w(m,d)]][\textbf{exh}_e[\lambda d.\lambda w.T_w(j,d)]]$
c. the set of worlds *w* s.t. the maximal degree *d* s.t. John is *d* tall in *w* exceeds or is equivalent to the *minimal* degree *d* s.t. Mary is **not** *d* tall in *w*

- Crucially employs $\textbf{exh}_e$ (and negation) at LF
- Similar to M-theory: problems with DE quantifiers (but also with non-monotone quantifiers)

Exhaustification and type-shift operations [Aloni 2007]

- **exh** takes now a domain D (type e) and a property P (type $e,(s,t)$) and returns the property of exhaustively satisfying P wrt D:

(46) a. $\textbf{exh}[D, P]$ type: $e(s,t)$
b. $\{\lambda x \lambda w[x$ exhaustively satisfies P wrt D in $w]\}$ [Zeevat 94]

Normally exhaustive values are maximal plural entities, but with scalar predication other exhaustification effects show up (min/max values)

- Properties can undergo two type-shifting operations:

(i) **Partee iota rule**: yields (intensional) max/min entities:

(47) a. $\text{SHIFT}_e(\textbf{exh}[D, P])$ $[= \textbf{exh}_e]$
b. $\{\lambda w.$the max/min entity from D satisfying P in $w\}$

(ii) **'Hamblin' question formation rule**: yields sets of mutually exclusive propositions:

(48) a. $\text{SHIFT}_{\langle s,t\rangle}(\textbf{exh}[D, P])$ $[= \textbf{exh}_{st}]$
b. $\{$only d_1 is P, only d_2 is P, only d_1 & d_2 are P, ... $\}$

Subtrigging via $\mathbf{exh}_e$

- Ruling out FC-*any* in episodic contexts:

(49)
a. #Any girl fell.
b. $[\forall](\mathbf{exh}_{st}[\text{any girl, fell}])$
c. $[\forall]$

only d_1 fell	only d_2 fell	only d_1 and d_2 fell	...

d. Predicted meaning: $\bot$

- Licensing FC-*any* under $\Diamond$:

(50)
a. Any girl may fall.
b. $[\forall](\Diamond(\mathbf{exh}_{st}[\text{any girl, fall}]))$
c. $[\forall]$

$\Diamond$ only d_1 falls	$\Diamond$ only d_2 falls	$\Diamond$ only d_1 and d_2 fall	...

d. Predicted meaning: universal free choice

- Licensing FC-*any* by subtrigging:

(51)
a. Any girl who tried to jump fell.
b. $[\forall](\mathbf{exh}_e[\text{any girl, who tried to jump}]\ \text{fell})$
c. $[\forall]$

d_1 fell	d_2 fell

d. Predicted meaning: Every girl who tried to jump fell

Exhaustivity theory: *any* and *some*

(52) a. John is taller than some girl.

b. $[\exists]$**er**[**exh**$_e$$[\lambda d.[\text{some girl}, \lambda x.\lambda w.\neg T_w(x,d)]]]$][**exh**$_e$$[\lambda d.\lambda w.T_w(j,d)]$]

c. $[\exists]\{\lambda w.max(\lambda d.T_w(j,d)) \geq min(\lambda d.\neg T_w(y,d)) \mid y \in \{\text{M, S}\}\}$

d. the set of worlds w s.t. **at least one** of the following holds: (i) the maximal degree d s.t. John is d tall in w exceeds or is equivalent to the *minimal* degree d s.t. **Mary** is not d tall in w (ii) the maximal degree d s.t. John is d tall in w exceeds or is equivalent to the *minimal* degree d s.t. **Sue** is not d tall in w

e. $\Rightarrow$ existential meaning

(53) a. John is taller than any girl.

b. $[\forall]$**er**[**exh**$_e$$[\lambda d.[\text{any girl}, \lambda x.\lambda w.\neg T_w(x,d)]]]$][**exh**$_e$$[\lambda d.\lambda w.T_w(j,d)]$]

c. $[\forall]\{\lambda w.max(\lambda d.T_w(j,d)) \geq min(\lambda d.\neg T_w(y,d)) \mid y \in \{\text{M, S}\}\}$

d. the set of worlds w s.t. **all** of the following hold: (i) the maximal degree d s.t. John is d tall in w exceeds or is equivalent to the *minimal* degree d s.t. **Mary** is not d tall in w (ii) the maximal degree d s.t. John is d tall in w exceeds or is equivalent to the *minimal* degree d s.t. **Sue** is not d tall in w

e. $\Rightarrow$ universal meaning

Comment: *Any* need not take scope under negation!

Exhaustivity theory: IRGEND versus SOME

(54) a. John is taller than IRGEND JEMAND$_F$.

b. $[\exists]\mathbf{er}[\mathbf{exh}_e[\lambda d.\neg[\text{irgndjemand}_F, \lambda x.w.T_w(x,d)]]][\mathbf{exh}_e[\lambda d.w.T_w(j,d)]]$

c. $[\exists]\{\lambda w.max(\lambda d.T_w(j,d)) \geq min(\lambda d.\neg\exists x T_w(x,d))\}$

d. the set of worlds *w* s.t. the maximal degree *d* s.t. John is *d* tall in *w* exceeds or is equivalent to the *minimal* degree *d* s.t. **nobody** is *d* tall in *w*

e. ⇒ universal meaning

(55) a. John is taller than SOMEONE$_F$.

b. $[\exists]\mathbf{er}[\mathbf{exh}_e[\lambda d.[\text{someone}_F, \lambda x.\lambda w.\neg T_w(x,d)]]][\mathbf{exh}_e[\lambda d.\lambda w.T_w(j,d)]]$

c. $[\exists]\{\lambda w.max(\lambda d.T_w(j,d)) \geq min(\lambda d.\exists x \neg T_w(x,d))\}$

d. the set of worlds *w* s.t. the maximal degree *d* s.t. John is *d* tall in *w* exceeds or is equivalent to the *minimal* degree *d* s.t. **somebody** is not *d* tall in *w*

e. ⇒ existential meaning

Assumption: *Irgend*-indefinites must scope under negation in *than*-clause, while *some* (like other ordinary quantifiers) must scope out of negation

Summary and conclusions

- Predictions:

(56)

	some	any	IRGEND	SOME
S-theory	yes	via $\mathbf{exh}_{st}$	yes	no
M-theory	yes	via $\mathbf{exh}_{st}$	yes	yes
Ex-theory	yes	via $\mathbf{exh}_{e}$	yes	yes

- Assumptions:
  - M-theory: *some* (like ordinary quantifiers) must scope out of negation, *any* and *irgend* must scope under negation
  - Ex-theory: *some* (like ordinary quantifiers) must scope out of negation, *irgend* must scope under negation (*any* can choose)
- Conclusions:
  - Alternative semantics analysis of FC-*any* can be extended to the case of comparatives;
  - Variable behavior of *some, any* and *irgend* derived;
  - Universal meaning of stressed-*irgend* explained via existential closure triggered by focus.