LIN6049
Advanced semantics: puzzles in meaning

2024-2025

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Week 11

Today

General feedback on puzzle 6

Quantifiers, part 1

General feedback on puzzle 6

Task: explain the behaviour of demonstrative determiners in the absence of pointing using the tools given in class

General feedback on puzzle 6

Task: explain the behaviour of demonstrative determiners in the absence of pointing using the tools given in class

(1) #That computer is old

(2) A woman walked into the room. This/that woman was wearing a funny hat

General feedback on puzzle 6

Semantics for *that* with pointing:

‘[That NP]$_{\rightarrow L}$ VP’

Presupposition: |{x: x is an NP in s and x is in L in s and speaker points at L in s and L is not close to the speaker in s}| = 1

Assertion: {x: x is an NP in s and x is in L in s and speaker points at L in s and L is not close to the speaker in s} ∩ {x: x VPs in s} ≠ ∅

General feedback on puzzle 6

Semantics for *this* with pointing:

‘[This NP]$_{\rightarrow L}$ VP’

Presupposition: |{x: x is an NP in s and x is in L in s and speaker points at L in s and L is close to the speaker in s}| = 1

Assertion: {x: x is an NP in s and x is in L in s and speaker points at L in s and L is close to the speaker in s} ∩ {x: x VPs in s} ≠ ∅

General feedback on puzzle 6

Questions to aid you in your thinking:

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-what happens to the semantics of *that* and *this* if you remove pointing, what results from that removal? How can this be used to explain the oddness of (1)?

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Questions to aid you in your thinking:

-what happens to the semantics of *that* and *this* if you remove pointing, what results from that removal? How can this be used to explain the oddness of (1)?

-what happens in (2) if you remove the pointing from *this* and *that* from the semantics? Is that a good thing or a bad thing?

General feedback on puzzle 6

Questions to aid you in your thinking:

-how have we explained in the past the ability of a definite determiner to refer back to an entity that was previously introduced in the discourse? Would that help you with (2)? What would you have to say about *this* and *that* to make this work? What evidence could you produce here to support your proposal?

Quantifiers

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Some allow us to formulate universals regarding their meaning

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Quantifiers have a number of interesting properties

Some allow us to formulate universals regarding their meaning

Others have proven useful in explaining certain natural language phenomena

Quantifiers

(1) Every vampire yawns

Quantifiers

(1) Every vampire yawns

(2) Most vampires yawn

Quantifiers

(1) Every vampire yawns

(2) Most vampires yawn

(3) Some vampires yawn

Quantifiers

(1) Every vampire yawns

(2) Most vampires yawn

(3) Some vampires yawn

(4) Few vampires yawn

Quantifiers

(1) Every vampire yawns

(2) Most vampires yawn

(3) Some vampires yawn

(4) Few vampires yawn

(5) No vampires yawn

Quantifiers

(1) Every vampire yawns

(2) Most vampires yawn

(3) Some vampires yawn

(4) Few vampires yawn

(5) No vampires yawn

Q (A) (B)

Quantifiers

(1) **Every** vampire yawns

(2) **Most** vampires yawn

(3) **Some** vampires yawn

(4) **Few** vampires yawn

(5) **No** vampires yawn

Q (A) (B)

Quantifiers

(1) **Every** vampire yawns

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Q (A) (B)

Quantifiers

(1) **Every** vampire yawns

(2) **Most** vampires yawn

(3) **Some** vampires yawn

(4) **Few** vampires yawn

(5) **No** vampires yawn

Q (A) (B)

A semantic universal: conservativity

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All natural language quantifiers are conservative

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All natural language quantifiers are conservative

The truth of Q (A) (B) depends on members in A, not on members that are not in A (A')

A semantic universal: conservativity

All natural language quantifiers are conservative

The truth of Q (A) (B) depends on members in A, not on members that are not in A (A')

Example: to determine the truth of *Every vampire yawns*, you look at vampires (and then check whether they yawn or not). You don't look at **non**-vampires

A semantic universal: conservativity

Definition:

A quantifier Q is conservative if for all sets A and B,

Q (A)(B) is equivalent to Q (A)($A \cap B$)

A semantic universal: conservativity

A quantifier Q is conservative if for all sets A and B,
Q (A)(B) is equivalent to Q (A)(A $\cap$ B)

(1) Every vampire yawns

A semantic universal: conservativity

A quantifier Q is conservative if for all sets A and B,
Q (A)(B) is equivalent to Q (A)($A \cap B$)

(1) Every vampire yawns
(6) Every vampire is a vampire who yawns

A semantic universal: conservativity

A quantifier Q is conservative if for all sets A and B,
Q (A)(B) is equivalent to Q (A)(A $\cap$ B)

(1) Every vampire yawns
(6) Every vampire is a vampire who yawns
(2) Most vampires yawn
(7) Most vampires are vampires who yawn

A semantic universal: conservativity

A quantifier Q is conservative if for all sets A and B,
Q (A)(B) is equivalent to Q (A)(A $\cap$ B)

(4) Some vampires yawn
(8) Some vampires are vampires who yawn
(5) No vampire yawns
(9) No vampire is a vampire who yawns

A semantic universal: conservativity

Notice that it is perfectly possible to define a non-conservative quantifier. For example:

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‘Somenon NP VP’
Assertion: something that is not in NP is in VP

A semantic universal: conservativity

Notice that it is perfectly possible to define a non-conservative quantifier. For example:

‘Somenon NP VP’
Assertion: something that is not in NP is in VP

(10) Somenon vampires yawn
Assertion: something that is not a vampire yawns

A semantic universal: conservativity

The point is a more interesting one (in a way): even though it is possible to definite non-conservative quantifiers, *natural languages choose not to use them*

A semantic universal: conservativity

The point is a more interesting one (in a way): even though it is possible to definite non-conservative quantifiers, *natural languages choose not to use them*

So this is a constraint on meanings imposed by human cognition—quantifiers can reveal to us what sorts of meanings human cognition is and isn't sensitive to!

Monotonicity

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So monotonicity is another aspect of the meaning of quantifiers that allows us to tap into human cognition

Monotonicity

(5) No vampire yawns

Monotonicity

(5) No vampire yawns

Monotonicity

(5) No vampire yawns

(11) No blonde vampire yawns

Monotonicity

(5) No vampire yawns →

(11) No blonde vampire yawns

If (5) is true, (11) is necessarily true

Monotonicity

(5) No vampire yawns $\longrightarrow$

(11) No blonde vampire yawns

If (5) is true, (11) is necessarily true

The set of blonde vampires is a subset of the set of vampires

Monotonicity

(5) No vampire yawns →

(11) No blonde vampire yawns

If (5) is true, (11) is necessarily true

The set of blonde vampires is a subset of the set of vampires

So *no* licenses inferences from supersets to subsets in the A argument

Monotonicity

(5) No vampire yawns →

(11) No blonde vampire yawns

No is downward monotonic in the first/left argument

If (5) is true, (11) is necessarily true

The set of blonde vampires is a subset of the set of vampires

So *no* licenses inferences from supersets to subsets in the A argument

Monotonicity

(5) No vampire yawns $\not\leftarrow$

(11) No blonde vampire yawns

(11) does **not** entail (5)

Monotonicity

(5) No vampire yawns $\not\leftarrow$

(11) No blonde vampire yawns

(11) does **not** entail (5)

If no blonde vampire yawns, it doesn’t mean that no vampires yawn. Maybe the brunette ones do!

Monotonicity

Definition:

A quantifier Q is downward monotonic in the first/left argument if for all sets A, B and C:

if $A \subseteq B$ and Q(B)(C), then Q(A)(C)

Monotonicity

(5) No vampire yawns

(12) No vampire yawns noisily

Monotonicity

(5) No vampire yawns

(12) No vampire yawns noisily

Monotonicity

(5) No vampire yawns $\longrightarrow$

(12) No vampire yawns noisily

If (5) is true, (12) is necessarily true

Monotonicity

(5) No vampire yawns $\longrightarrow$

(12) No vampire yawns noisily

If (5) is true, (12) is necessarily true

The set of noisy yawners is a subset of the set of yawners

Monotonicity

(5) No vampire yawns ⟶

(12) No vampire yawns noisily

If (5) is true, (12) is necessarily true

The set of noisy yawners is a subset of the set of yawners

So *no* licenses inferences from supersets to subsets in the B argument

Monotonicity

No is downward monotonic in the second/right argument

(5) No vampire yawns →

(12) No vampire yawns noisily

If (5) is true, (12) is necessarily true

The set of noisy yawners is a subset of the set of yawners

So *no* licenses inferences from supersets to subsets in the B argument

Monotonicity

Definition:

A quantifier Q is downward monotonic in the second/right argument if for all sets A, B and C:

if $A \subseteq B$ and Q(C)(B), then Q(C)(A)

Monotonicity

(3) Some vampires yawn

(13) Some blonde vampires yawn

Monotonicity

(3) Some vampires yawn

(13) Some blonde vampires yawn

(3) Some vampires yawn

(14) Some vampires yawn noisily

Monotonicity

(3) Some vampires yawn ←

(13) Some blonde vampires yawn

(3) Some vampires yawn ←

(14) Some vampires yawn noisily

Monotonicity

(3) Some vampires yawn ←

(13) Some blonde vampires yawn

Some is upward monotonic in the first/left argument

(3) Some vampires yawn ←

(14) Some vampires yawn noisily

Monotonicity

(3) Some vampires yawn ←

(13) Some blonde vampires yawn

Some is upward monotonic in the first/left argument

(3) Some vampires yawn ←

(14) Some vampires yawn noisily

Some is upward monotonic in the second/right argument

Monotonicity

Definitions:

A quantifier Q is upward monotonic in the first/left argument if for all sets A, B and C:

if $A \subseteq B$ and Q(A)(C), then Q(B)(C)

A quantifier Q is upward monotonic in the second/right argument if for all sets A, B and C:

if $A \subseteq B$ and Q(C)(A), then Q(C)(B)

Monotonicity

(1) Every vampire yawns →

(15) Every blonde vampire yawns

Every is downward monotonic in the first/left argument

(1) Every vampire yawns ←

(16) Every vampire yawns noisily

Every is upward monotonic in the second/right argument

Monotonicity table

	↓L	↓R	↑L	↑R
no	✓	✓	✗	✗
some	✗	✗	✓	✓
every	✓	✗	✗	✓
few	…	…	…	…

Behaviour of *any*

	↓L	↓R	↑L	↑R
no	✓	✓	✗	✗
some	✗	✗	✓	✓
every	✓	✗	✗	✓
few	...	...	...	...

Behaviour of *any*

	↓L	↓R	↑L	↑R
no	*any*	✓	✗	✗
some	✗	✗	✓	✓
every	✓	✗	✗	✓
few	...	...	...	...

Behaviour of *any*

	↓L	↓R	↑L	↑R
no	*any*	*any*	✗	✗
some	✗	✗	✓	✓
every	✓	✗	✗	✓
few	…	…	…	…

Behaviour of *any*

	↓L	↓R	↑L	↑R
no	*any*	*any*	✖	✖
some	✖	✖	✓	✓
every	*any*	✖	✖	✓
few	…	…	…	…

Behaviour of *any*

	↓L	↓R	↑L	↑R
no	*any*	*any*	✖	✖
some	✖	✖	✖	✖
every	*any*	✖	✖	✖
few	…	…	…	…

Behaviour of *any*

(17) No student gave *any* hint of what had happened that night in the woods

(18) No student who gave *any* hint of what had happened that night in the woods was reprimanded

Behaviour of *any*

(19) *Some student gave *any* hint of what had happened that night in the woods

(20) *Some student who gave *any* hint of what had happened that night in the woods was reprimanded

Behaviour of *any*

(21) *Every student gave *any* hint of what had happened that night in the woods

(22) Every student who gave *any* hint of what had happened that night in the woods was reprimanded

Behaviour of *any*

(23) *Henry discussed *any* poems with his students

Behaviour of *any*

(23) *Henry discussed *any* poems with his students

(24) Henry did not discuss *any* poems with his students

Behaviour of *any*

(23) *Henry discussed *any* poems with his students

(24) Henry did not discuss *any* poems with his students

Negation is also downward entailing (in its only argument):

Behaviour of *any*

(23) *Henry discussed *any* poems with his students

(24) Henry did not discuss *any* poems with his students

Negation is also downward entailing (in its only argument):

(25) Sally doesn't snore $\rightarrow$

(26) Sally doesn't snore noisily

Behaviour of *any*

Any is licensed only in downward-entailing environments

Behaviour of *any*

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In fact, other items, such as *ever*, *yet* or *at all* are subject to the same generalization

Behaviour of *any*

Any is licensed only in downward-entailing environments

In fact, other items, such as *ever*, *yet* or *at all* are subject to the same generalization

Negative polarity items are licensed only in downward-entailing environments

Behaviour of *any*

(27) *Henry *ever* discussed the poem

(28) Henry didn't *ever* discuss the poem

Behaviour of *any*

(27) *Henry *ever* discussed the poem
(28) Henry didn’t *ever* discuss the poem

(29) *Henry has discussed the poem *yet*
(30) Henry hasn’t discussed the poem *yet*

Behaviour of *any*

(27) *Henry *ever* discussed the poem
(28) Henry didn't *ever* discuss the poem

(29) *Henry has discussed the poem *yet*
(30) Henry hasn't discussed the poem *yet*

(31) *Henry discussed the poem *at all*
(32) Henry didn't discuss the poem *at all*

Behaviour of *any*

Cross-linguistically, negative polarity items are licensed only in downward-entailing environments

So, by studying a property of quantifiers, monotonicity, we can express far-reaching generalizations about human language

Other properties: symmetry

Other properties: symmetry

(33) Some dogs snore

Other properties: symmetry

(33) Some dogs snore

(34) Some snorers are dogs

Other properties: symmetry

(33) Some dogs snore ↔

(34) Some snorers are dogs

Other properties: symmetry

(33) Some dogs snore ↔

(34) Some snorers are dogs

(35) Every dog snores

Other properties: symmetry

(33) Some dogs snore ↔

(34) Some snorers are dogs

(35) Every dog snores

(36) Every snorer is a dog

Other properties: symmetry

(33) Some dogs snore $\leftrightarrow$

(34) Some snorers are dogs

(35) Every dog snores $\not\leftrightarrow$

(36) Every snorer is a dog

Other properties: symmetry

Definition:

A quantifier Q is symmetric if for all sets A and B:
Q(A)(B) is equivalent to Q(B)(A)

Other properties: transitivity

Definition:

A quantifier Q is transitive if for all sets A, B and C:
if Q (A)(B) and Q (B)(C), then Q (A)(C)

Other properties: transitivity

(1) Every vampire yawns +

(37) Every yawner is red-haired $\longrightarrow$

(38) Every vampire is red-haired

Other properties: transitivity

(3) Some vampires yawn +

(39) Some yawners are red-haired $\not\to$

(40) Some vampires are red-haired

Puzzle 8

Quantifiers in the *there* construction in English: what’s the generalization?