# Negation

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# Outline

# References

Cooper and Ginzburg (2011a,b)

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# Classical view of negation

- truth functional connective
- true $\rightarrow$ false, false $\rightarrow$ true
- in terms of possible worlds: negation maps a set of possible worlds to its complement set
- looking at the behaviour of negation in dialogue shows that this is only part of the story
- we will suggest that the interpretation of negation involves being able to distinguish positive and negative propositions

# *No* in dialogue

*Child approaches socket with nail*

| | |
|---|---|
| Parent: | No. [“Don’t put the nail in the socket.”] |
| | Do(#n’t) you want to be electrocuted? |
| Child: | No. [“I don’t want to be electrocuted.”] |
| Parent: | No. [“You don’t want to be electrocuted.”] |

# Negative questions

- Classically the content of $p?$ is identical to that of $\neg p?$ (Hamblin, 1973; Groenendijk and Stokhof, 1997).
- Derives from view that the contents of questions are the sets of propositions corresponding to their answers
- Our view is that while the sets of propositions corresponding to the *answers* to positive and negative questions are the same, the *contents* of the questions are distinct.

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- Suggestion that there is reason to believe the positive
- This holds for negation in assertions as well

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- The statue's left foot has no #toe/toes

Fillmore (1985)

# Creating an expectation within a dialogue

*Resources local to a dialogue*

A: My husband keeps walnut shells in the bedroom.
B: Millie's lucky in that respect. Her husband doesn't have any walnut shells.

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- Some languages have different words for *yes* depending on positive and negative propositions

# Different words for *yes*

- *French*
  A: Marie est une bonne étudiante B: Oui / #Si.
  A: Marie n'est pas une bonne étudiante B: #Oui / Si.
- German *ja/doch*, Swedish *ja/jo*, . . .

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- There are lots of ways of making a negative sentence, *not*, negative quantifiers (*no*, *none*, *nothing*), French *(ne)...pas/point/rien*: *je n’en sais rien/ j’en sais rien* (“I know nothing about it”), Swedish words for *not*: *inte, ej*

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- Answer: the semantic property that they introduce negative propositions

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Desideratum 3 positive and negative propositions can be distinguished

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- hybrid classical and intuitionistic negation

# Witnesses for negative types refined

- $a : \neg T$ iff there is some $T'$ such that $a : T'$ and $T'$ precludes $T$ *and there is some expectation that* $a : T$
- some question of whether this addition should be included here or in some theory of when agents are likely to make judgements

# Expectations

- What does it mean for there to “be some expectation”?
- Recall the kind of functions we used to predict completions of events, grammar rules: dependent types.
- Discussion relating these dependent types to Aristotelian enthymemes in (Breitholtz, 2010; Breitholtz and Cooper, 2011)
- Set of such dependent types are part of general or local resources.

# Austinian propositions

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- $\begin{bmatrix} \text{sit} & : & \mathit{Rec} \\ \text{sit-type} & : & \mathit{cl}_{\neg}(\mathit{map}_{\neg}(\mathit{RecType})) \end{bmatrix}$ – type of negative Austinian propositions, *NegProp*
- $\begin{bmatrix} \text{sit} & : & \mathit{Rec} \\ \text{sit-type} & : & \mathit{RecType} \end{bmatrix}$ – type of positive Austinian propositions, *PosProp*

# Negation of Austinian propositions

- $\begin{bmatrix} \text{sit} & = & s \\ \text{sit-type} & = & T \end{bmatrix}$
- $\begin{bmatrix} \text{sit} & = & s \\ \text{sit-type} & = & \neg T \end{bmatrix}$

# Truth for Austinian propositions

An Austinian proposition $p$ is *true* iff $p.\text{sit} : p.\text{sit-type}$

# Conclusions

- Negation in natural language is not a simple “truth-value flipping” truth functional connective
- There are types *Negative Proposition* and *Positive Proposition*
- Positive and negative questions are distinct
- Negations require positive expectations
- Exhaustive answers to positive and negative questions are equivalent
- Distinguishing positive and negative propositions allows a straightforward characterization of the content of *no*-answers and distinct words for “yes” (*oui/si*) in many languages

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