

# The Processing of Scalar Implicatures

Day 4 - 31/7/2009

Eytan Zweig

EGG 2009, Poznań

# Local vs. global implicature processing

1. Every boy ate some of the peas.
2. Every boy ate all of the peas.
- (2) is stronger than (1).
3.  $\Rightarrow$  Every boy ate some of the peas, and it's not true that every boy ate all of the peas.
3.  $\Rightarrow$  Every boy ate some, but not all, of the peas.

# Local vs. global implicature processing

1. Kai had the broccoli or some of the peas last night.
  2. Kai had the broccoli or all of the peas last night.
- (2) is stronger than (1).
3.  $\Rightarrow$  Kai had the broccoli or some of the peas last night, but not the broccoli or all of the peas.
  4.  $\Rightarrow$  Kai didn't have the broccoli.
- 
3.  $\Rightarrow$  Kai had the broccoli or he had some, but not all, of the peas.

# Local vs. global implicature processing

1. John believes Kai ate some of the peas.
2. John believes Kai ate all of the peas.
- (2) is stronger than (1).
3.  $\Rightarrow$  John believes Kai ate some of the peas, but it's not true that John believes Kai ate all of the peas.
4.  $\Rightarrow$  John believes Kai ate some, and maybe all, of the peas.
3.  $\Rightarrow$  John believes Kai ate some, but not all, of the peas.

# Local vs. global implicature processing

1. [x ate some of the peas]
2. [x ate all of the peas]
- (2) is stronger than (1).
3. [x ate some, but not all of the peas]
4. Every boy [x ate some, but not all, of the peas].
5. Every boy ate some, but not all, of the peas.

# Local vs. global implicature processing

1. [x ate some of the peas]
2. [x ate all of the peas]
- (2) is stronger than (1).
3. [x ate some, but not all of the peas]
4. Kai ate the broccoli or [x ate some, but not all, of the peas].
5. Kai ate the broccoli or some, but not all, of the peas.

# Between “Cost” and “Default” of Scalar Implicature: the Cost of Embedding

Francesca Foppolo  
Dept. of Psychology  
University of Milano-Bicocca

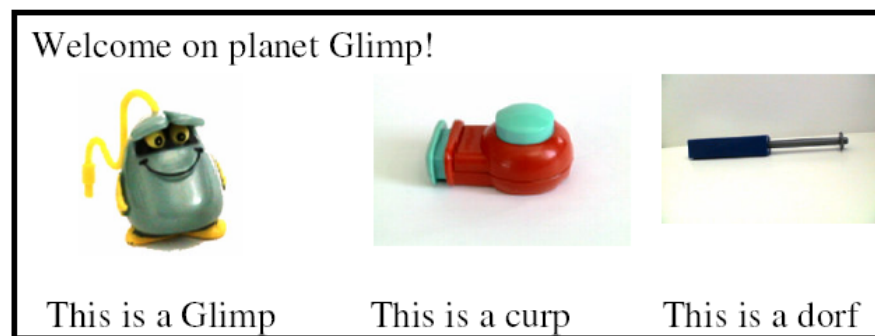
## Foppolo (2008)

- If implicatures have some cost, and are calculated locally, it follows that embedded implicatures should be harder than unembedded ones.
- This is not predicted by global accounts, as the syntactic environment of the implicature trigger shouldn't matter.



# Foppolo (2008)

- 30 participants had to judge sentences relative to scenarios.
- They were instructed to be “charitable”.
- Whenever they gave a “true” answer, they also had to rate the sentence from 1-5 on how appropriate it is.
- In order to avoid world-knowledge effects, sentences were used with made up words.



# Foppolo (2008)

- There were two types of sentences:
  - a. If a Glimp has a curp *or* a dorf, he also has a pencil  
[DE]
  - b. If a Glimp has a pencil, he also has a curp *or* a dorf  
[NON-DE]
- And two kinds of situations:
  - Sentences where the inclusive reading is true but the exclusive false
  - Sentences where both are true.

# Foppolo (2008)

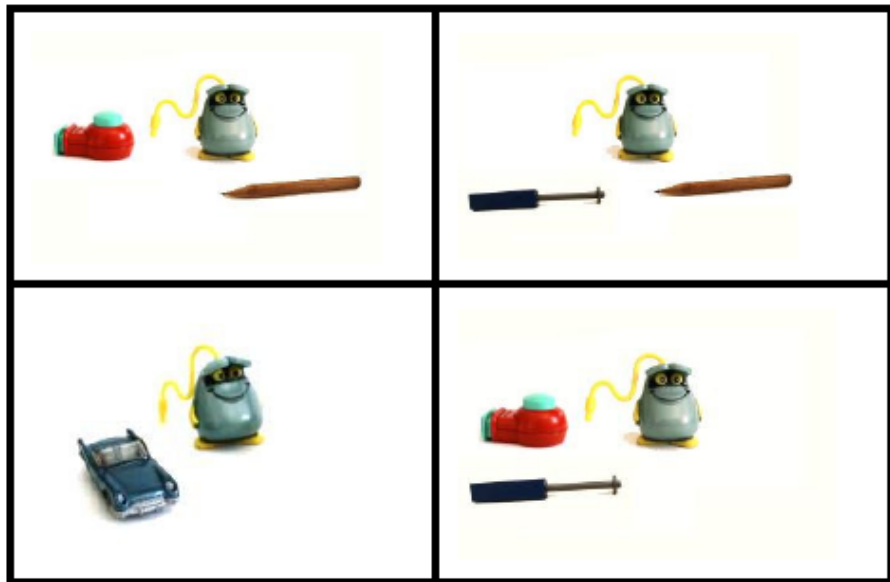


Fig. 2: (S1)  
DC for DE context: *exclusive* “or” true  
(curp & dorf but no pencil)

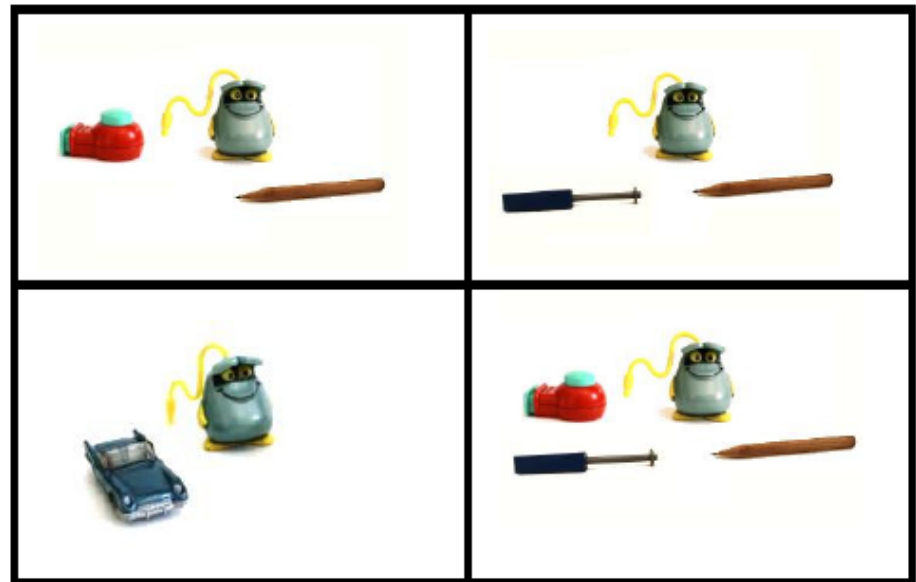


Fig. 3: (S2)  
DC for NON-DE context: *inclusive* “or” true  
(curp & dorf but no pencil)

# Foppolo (2008)

1	2	3	4	5	6	7	8
Sentence	Context	Situation	True	Scale rate	RTs for True	RTs for False	Mean RTs (n.)
(a)	DE	S1 (DC)	<b>57%</b>	3.47	11320	7167	9628 (n.27)
		S2 (NDT)	<b>90%</b>	3.81	8937	12362	9291 (n.30)
(b)	NON-DE	S2 (DC)	<b>77%</b>	4.04	10183	11754	10562 (n.29)
		S1 (NDT)	<b>87%</b>	4.38	9734	8341	9549 (n.29)

 Semantics & Pragmatics Volume 2, Article 2: 1-33, 2009  
doi: [10.3765/sp.2.2](https://doi.org/10.3765/sp.2.2)

**Universal implicatures and free choice effects:  
experimental data\***

Emmanuel Chemla  
*Institut Jean-Nicod, DEC-ENS, Paris*  
*University College London*


# Chemla(2009)

- (7) a. John read some of the books.  $\rightsquigarrow$  John didn't read all the books.  
b. Every student read some of the books.  
 $\rightsquigarrow$  Each student is such that he didn't read all the books.
- (8) a. John didn't read all the books.  $\rightsquigarrow$  John read some of the books.  
b. No student read all the books.  $\rightsquigarrow$  Each student read some of the books.
- (12) a. John is allowed to have an apple or a banana.  
 $\rightsquigarrow$  John can choose between the two fruits.  
b. Every student is allowed to have an apple or a banana.  
 $\rightsquigarrow$  Every student can choose between the two fruits.
- (15) Context: Every student is required to do  $A$  or  $B$ , we don't know yet whether some students will have to do both.  
a. John is not required to do  $A$  and  $B$ .  
 $\rightsquigarrow$  John may choose between  $A$  and  $B$ .  
b. No student is required to do  $A$  and  $B$ .  
 $\rightsquigarrow$  Every student may choose between  $A$  and  $B$ .

# Chemla (2009)

(i) “Everyone had an excellent grade.”


→ → → Everyone passed his exam.

  
*weak*

*strong*

(ii) “John had a very bad grade.”

→ → → John passed his exam.

  
*weak*

*strong*

“John is allowed to give me the dissertation or the commentary.”

→ → → John can choose which of the two he will give to the teacher.

*weak*

*strong*

“Everybody is allowed to give me the dissertation or the commentary.”

→ → → Everybody can choose which of the two he will give to the teacher.

*weak*

*strong*

# Chemla (2009)

(16) Positive vs. negative cases (for both scalar implicatures and free choice):

a. Globalists: there should be **no difference** between positive and negative cases.

The universal inferences should be absent in both cases.

b. Localists: there should be a **difference** between the positive and the negative cases.

The universal inference should arise in the former and not in the latter case.

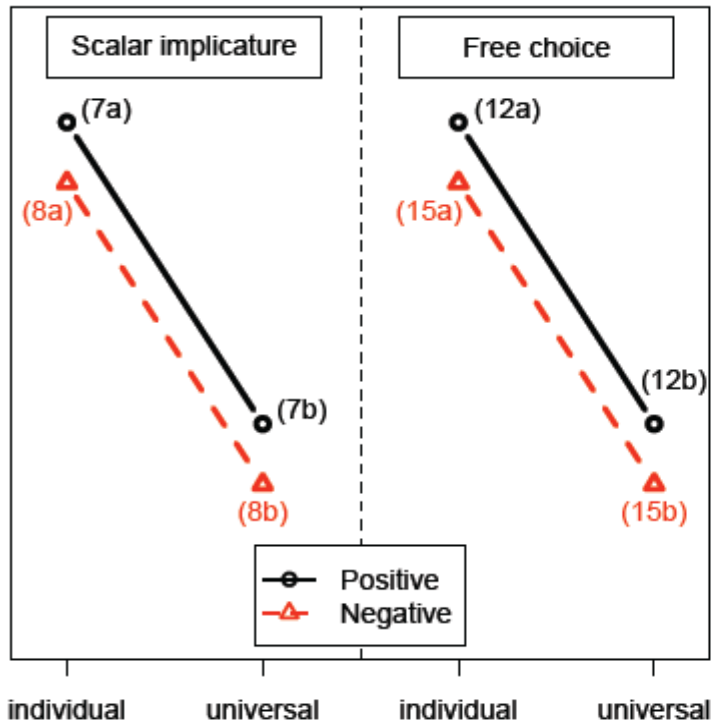
(17) Positive case, scalar implicatures (SI) vs. free choice (FC):

a. Globalists: there should be **no difference** between SI and FC.  
The universal inferences should not arise.

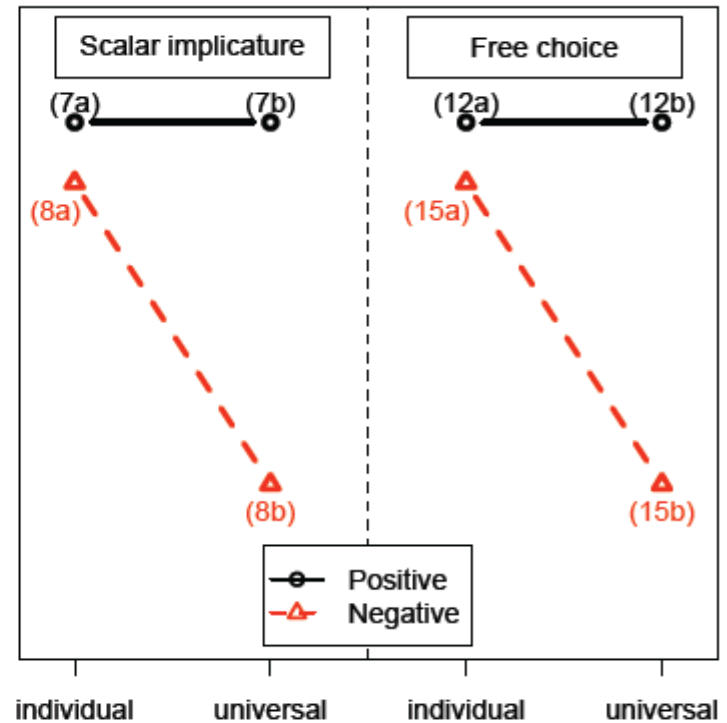
b. Localists: there should be **no difference** between SI and FC.  
The universal inferences should arise in both cases.



# Chemla (2009)

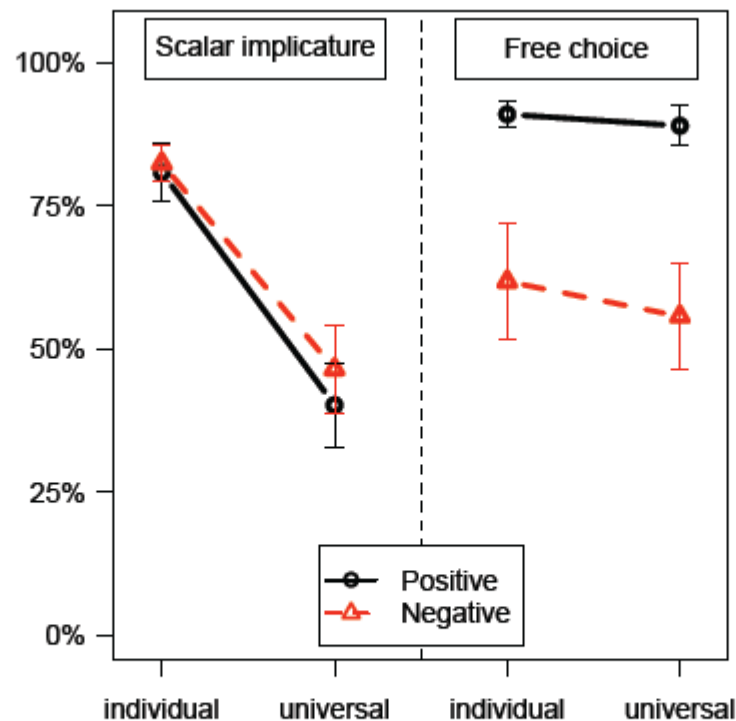


(a) Predictions from a globalist treatment of implicatures



(b) Predictions from a localist treatment of implicatures

# Chemla (2009)



**Figure 4** Actual results - mean rates for each inference (% of the line filled)

# Embedded implicatures?!?

Bart Geurts  
Nausicaa Pouscoulous

# Geurts & Pouscoulous (2008)

	<i>target sentence</i>	<i>candidate inference</i>
$\emptyset$	Fred heard some of the Verdi operas.	He didn't hear all of them.
<i>all</i>	All students heard some of the Verdi operas.	None of the students heard them all.
<i>must</i>	Fred has to hear some of the Verdi operas.	He isn't allowed to hear all of them.
<i>think</i>	Betty thinks Fred heard some of the Verdi operas.	She thinks he didn't hear all of them.
<i>want</i>	Betty wants Fred to hear some of the Verdi operas.	She wants him not to hear all of them.

Table 1: Sample sentences used in Experiments 1a-b.

# Geurts & Pouscoulous (2008)

Emilie says:

“Betty thinks that Fred heard some of the Verdi operas.”

Would you infer from this that Betty thinks that Fred didn't hear all the Verdi operas?

yes       no

Figure 1: Trial used in Experiments 1a-b.

# Geurts & Pouscoulous (2008)

	$\emptyset$	<i>all</i>	<i>must</i>	<i>think</i>	<i>want</i>
<i>Experiment 1a</i>	.93	.27	.03	.50	–
<i>Experiment 1b</i>	.94	–	–	.65	.32

Table 2: Rates of positive responses observed in Experiments 1a-b.

# Geurts & Pouscoulous (2008)

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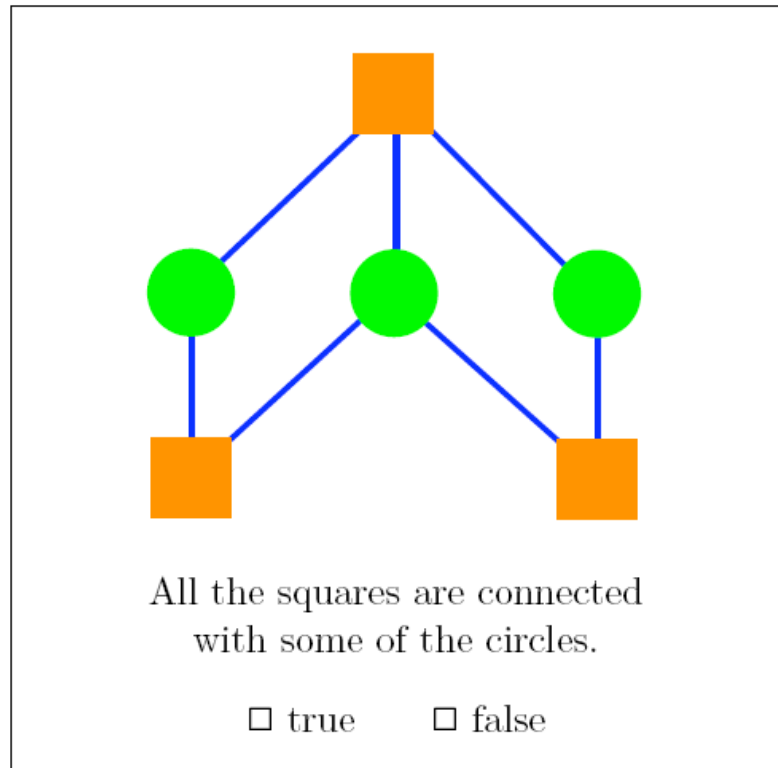
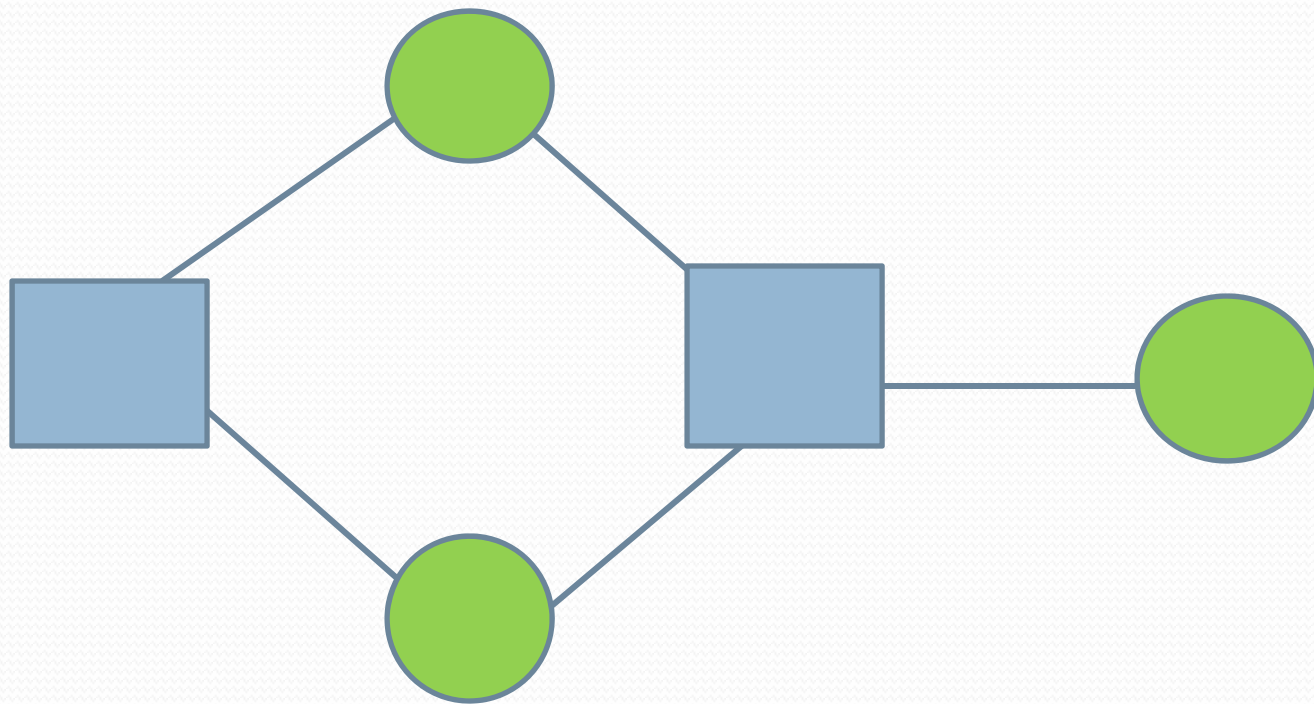
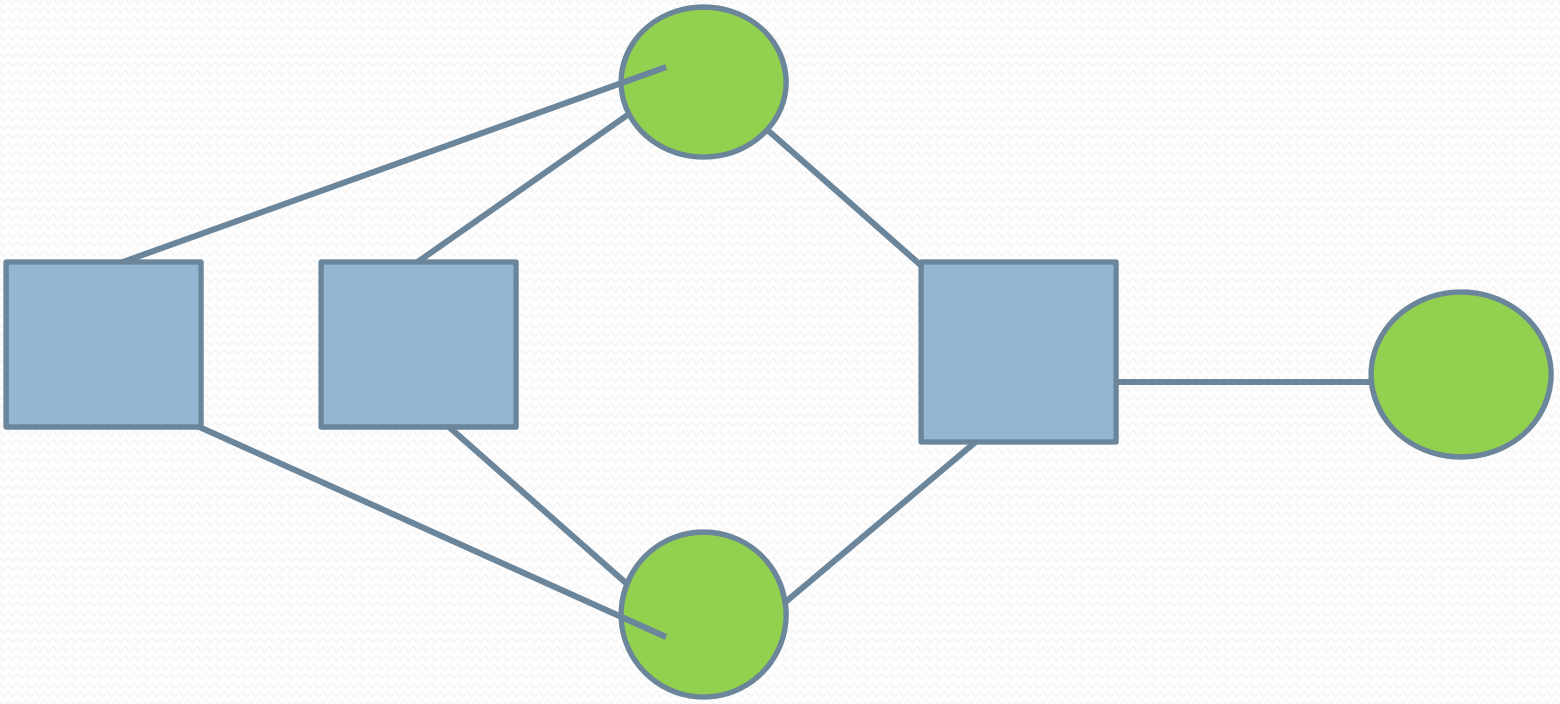


Figure 2: Verification item used in Experiment 3.







# Geurts & Pouscoulous (2008)

Betty says:

“All the squares are connected with some of the circles.”

Could you infer from this that, according to Betty:

All the squares are connected with some but not all of the circles.

yes       no

Figure 3: Inference item used in Experiment 3.

# Geurts & Pouscoulous (2008)

	<i>verification</i>		<i>inference</i>	
<i>all</i>	1	(0)	.46	(1)
<i>more than one</i>	1	(0)	.62	(1)
<i>exactly two</i>	1	(0)	.5	(1)
<i>exactly two</i>	0	(1)		
<i>not all</i>	.04	(0)	.58	(0)
<i>not more than one</i>	.04	(0)	.46	(0)

Table 3: Rates of positive responses observed in Experiment 3. Response trends predicted by mainstream conventionalism are given in brackets. Note that there were two verification conditions with “exactly two” against one inference condition.

# Geurts & Pouscoulous (2008)

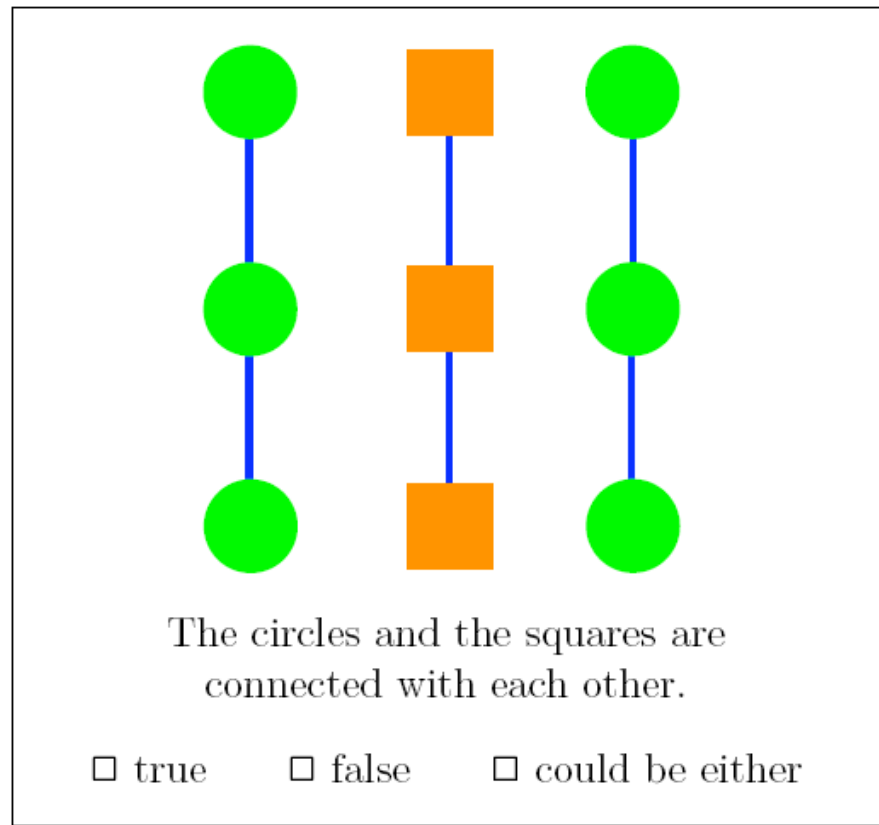


Figure 4: Control item used in Experiment 4.

# Geurts & Pouscoulous (2008)

	<i>yes</i>	<i>no</i>	<i>both</i>
<i>all</i>	.95	.05	0
<i>more than one</i>	1	0	0
<i>exactly two</i>	.86	.05	.09
<i>exactly two</i>	.09	.77	.14
<i>not all</i>	.09	.86	.05
<i>not more than one</i>	.09	.91	0

Table 4: Response rates for the critical and DE control items in Experiment 4. The percentages in the shaded cells are inconsistent with minimal conventionalism. As in Experiment 3, there were two trials with “exactly two”.