Presupposition projection from \textit{none}: An experimental investigation

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Presupposition Projection

Projection is a hallmark of presupposition:

(1) Bear won the race ⇝ Bear participated in the race
(2) Bear did not win the race ⇝ Bear participated
(3) If Bear won the race, Frog is glad ⇝ Bear participated
(4) Did Bear win the race? ⇝ Bear participated

When the inference is preserved, we say the presupposition projects.
But it is possible to **not derive the inference:**

(5) Bear did not win the race... he never participated!
   a. \( \approx \text{It’s not the case that Bear participated and won} \)

In such a case, we have a **presuppositionless** reading.
When embedded under the universal quantifier *none* as in (6), what the result of projection is is not clear.

(6) None of the bears won the race

**Three candidate readings:**

(7) a. **EXISTENTIAL:** *At least one of the bears participated and none of them won.*

b. **UNIVERSAL:** *All of the bears participated and none of them won.*

c. **PRESUPPOSITIONLESS:** *None of the bears both participated and won.*

**Our goal:** test to what extent these readings are accessible
Previous Studies
Chemla 2009, Evidence for universal reading

Inference task, testing the UNIVERSAL reading:

Know

“None of these 10 students knows that he is lucky.”

suggests that:
Each of these 10 students is lucky.

No? Yes?

All

“All of these 10 students missed all of their exams.”

suggests that:
Each of these 10 students missed some of their exams.

No? Yes?

More than 80% ‘yes’ for know, significantly higher than all.

Evidence that a universal reading exists
Previous Studies
Sudo, Romoli, Fox and Hackl, 2011, Evidence for non-universal reading

TVJT (assumption: universal presupposition $\rightarrow$ rejection):

```
None of these three circles have the same color as both of the squares in their own cell.
```

Half of the speakers accepted the description, *even though the left circle has only one square in its cell.*

**Evidence that non-universal reading exists**
TVJT (assumption: universal presupposition → rejection):

No circle has the same color as the square to which it is connected.

Acceptance > 92%, despite there being a circle with no square
Evidence that non-universal reading exists
Summary of the previous results

- Chemla, 2009: Existence of universal reading
- Sudo et al., 2011; Geurts and van Tiel, 2015: Existence of non-universal readings

Interim Conclusions

- **No** clear experimental evidence for EXISTENTIAL readings:
  - Sudo et al., 2011 and Geurts and van Tiel, 2015 do not distinguish between EXISTENTIAL and PRESUPPOSITIONLESS readings.
We separately tested for the existence of:

- the UNIVERSAL reading
- the EXISTENTIAL reading
- the PRESUPPOSITIONLESS reading

Covered-Box paradigm (Huang, Spelke and Snedeker, 2013), \(\approx\) rejection task, successfully used to investigate presuppositions
In the morning race, these three bears did really well, and in the end one of them won. I thought they would do well later in the day as well, but... [Audio]
**ONLYSome** condition (4 repetitions):
2 out of 3 bears ran and lost

_None of the bears won the afternoon race_ [Audio]

- **Universal** → **Covered** picture (not all bears ran)
- **Existential** → **Visible** picture (at least 1 bear ran but none won)
- **Presuppositionless** → **Visible** (The winner is not a bear)
**Experiment**

**NoRunner**

**NoRunner** condition (4 repetitions):
No bear ran the race

None of the bears won the afternoon race [Audio]

- **Universal** → **Covered** picture (not all bears ran)
- **Existential** → **Covered** picture (not even 1 bear ran)
- **Presuppositionless** → **Visible** (The winner is not a bear)
**TrueControl** condition (2 repetitions):
All bears participated but **none won**

None of the bears won the afternoon race [Audio]
**FalseControl** condition (2 repetitions):
All bears participated and *one of them won*

None of the bears won the afternoon race [Audio]
Universal-specific predictions

**TrueControl**

- **Universal**
  - ✓
- **Existential**
  - ✓
- **Presuppositionless**
  - ✓

**OnlySome**

- **Universal**
  - ×
- **Existential**
  - ✓
- **Presuppositionless**
  - ✓

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**Experiment**

**Predictions**

### Existential-specific predictions

<table>
<thead>
<tr>
<th></th>
<th>Universal</th>
<th>Existential</th>
<th>Presuppositionless</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONLY SOME</strong></td>
<td><img src="Image" alt="Diagram" /></td>
<td><img src="Image" alt="Diagram" /></td>
<td><img src="Image" alt="Diagram" /></td>
</tr>
<tr>
<td><strong>NO RUNNER</strong></td>
<td><img src="Image" alt="Diagram" /></td>
<td><img src="Image" alt="Diagram" /></td>
<td><img src="Image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

![Diagram](Image)

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Presupposition projection from *none*
**Presuppositionless-specific predictions**

<table>
<thead>
<tr>
<th>NoRunner</th>
<th>Universal</th>
<th>Existential</th>
<th>Presuppositionless</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>FalseControl</td>
<td><img src="image2.png" alt="Image" /></td>
<td>✗</td>
<td>✗</td>
</tr>
</tbody>
</table>
Also 4 true and 4 false fillers
- *None of the bears were on the couch during the afternoon race*
- *None of the bears ran in the afternoon race* (final trials)

Exclusion criterion: < 75% accuracy on fillers (*not* ≤): total of 42 subjects analyzed

Also collected Reaction Times
Results (N=42)

Controls

- Good accuracy on controls
- Participants understood the task and the descriptions
**Results (N=42)**

**ONLY SOME: evidence for UNIVERSAL**

**Significant rejection: only UNIVERSAL can yield it**
Results (N=42)

**ONLY SOME vs. NO RUNNER:** evidence for existential

![Bar chart showing the choice of covered conditions for TrueControl, OnlySome, NoRunner, and FalseControl.]

- **Universal**
  - ONLY SOME: ×
  - NO RUNNER: ×

- **Existential**
  - ONLY SOME: ✓
  - NO RUNNER: ×

- **Presuppositionless**
  - ONLY SOME: ✓
  - NO RUNNER: ✓

Significant contrast: only **EXISTENTIAL** can yield it
**Results (N=42)**

**NoRunner:** evidence for **presuppositionless**

- **NoRunner**: evidence for presuppositionless

<table>
<thead>
<tr>
<th>Condition</th>
<th>TrueControl</th>
<th>OnlySome</th>
<th>NoRunner</th>
<th>FalseControl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice of Covered</td>
<td>0%</td>
<td>25%</td>
<td>50%</td>
<td>75%</td>
</tr>
</tbody>
</table>

- **Significant acceptance:** only presuppositionless can yield it
Results (N=42)

Summary

- Evidence for **universal**: rejection in **ONLY SOME**
- Evidence for **existential**: contrast **ONLY SOME** vs **NORUNNER**
- Evidence for **presuppositionless**: acceptance in **NORUNNER**
Results (N=42)

Reaction Times: evidence for **PRESUPPOSITIONLESS & EXISTENTIAL**

**Acceptance** reaction times:

- **NoRunner** > (**OnlySome = TrueControl**)  
  - **PRESUPPOSITIONLESS** = local accommodation = costly process (cf. Chemla & Bott, 2013)  
  - **EXISTENTIAL** = faster than **PRESUPPOSITIONLESS**
Discussion
Two types of theories

There are two broad types of projection theories

1. Those that predict a **universal projection** (Heim 1983, Schlenker 2008, a.o.)

2. Those that predict an **existential projection** (Beaver 1994, van der Sandt 1992, a.o.)

How to account for the three readings?
1) Universal-projection-only

- **Universal** = directly from *universal* projection
- **Existential** = reanalyzed as a *weakened* reading, from *domain restriction* \(\approx \text{none of the bears [who ran] won}\)
- **Presuppositionless** = local accommodation

Needs an extra mechanism: domain restriction (faster than local accommodation, cf. RTs)
2) **Existential-projection-only**

- **EXISTENTIAL** = directly from *existential* projection
- **UNIVERSAL** = reanalyzed as a *strengthened* meaning
- **PRESUPPOSITIONLESS** = local accommodation

Needs an extra mechanism: strengthening (optional)
3) Existential + Universal projections

- **EXISTENTIAL** = directly from existential projection
- **UNIVERSAL** = directly from universal projection
- **Presuppositionless** = local accommodation

Needs an extra assumption re. **ONLY** vs. **NORUNNER**: the more *true* readings a description has, the more it tends to be accepted (cf. Spector & Chemla 2011)
Conclusion

Conclusions

- Evidence for **all three readings** from *none*: **universal**, **existential** and **presuppositionless**

- Evidence for **local accommodation**, associated with **delay** (easily available: > 50% acceptance in **NoRunner**) 

- None of existential- and universal-only projection theories can **directly** account for all three readings
  1. Either there is a strengthening/weakening mechanism
  2. or both existential and universal projections exist in parallel
Conclusion

Future Directions

- Test children: Bill et al., 2015 suggest they resist accommodation
- Variant with “None of the three bears” to test domain restriction (cf. Geurts and van Tiel, 2015)
- Vary triggers (win, stop, ...) and tasks (covered box, inference)
Acknowledgments

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- Emmanuel Chemla, Stephen Crain, and Danny Fox (discussion)
- Dorothy Ahn (illustrations)


- **Geurts, B. and van Tiel, B. 2015.** “When all the five circles are four: new exercises in domain restriction.” *Topoi*, pp 1–14.

