

Projection Diversity: Experimental Evidence

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Projective Meaning

Meanings project when they are entailed despite appearing in an entailment-cancelling Family of Sentence (FoS) environment (Chierchia and McConnell-Ginet 1990). FoS environments include:

- Negation
- Antecedent of a Conditional
- Question
- Possibility modal

Projection Example

In the following sentence, (1a) is an assertion, which does not project in FoS environments such as (2) and (3), while (1b) is a presupposition, which does project.

1. John walked the dog.
 - a. John walked the dog.
 - b. There is a dog (a dog exists)
2. John did not walk the dog.
3. If John walked the dog, I will not have to.

Potential Difficulties 1

Most theories that tie projection to presupposition (anaphoric theories, common ground theories, etc.) face the following difficulties:

- Some non-backgrounded meanings project (Simons et al. 2011, *inter alia*). For example, Conventional Implicatures (CIs) such as *who is from Texas* in (4) are not assumed to be in the common ground at the time of utterance, but their entailments survive in FoS environments like (5) (Chierchia and McConnell-Ginet 1990, Potts 2005).
4. Lance, who is from Texas, bikes.
 5. Lance, who is from Texas, does not bike.

Potential Difficulties 2

Whereas the first difficulty had to do with over-projection (in a sense), the second problem has to do with under-projection:

- Some presuppositions do not project in all FoS environments (Abbott 2006, Abusch 2002, 2010, Simons 2001, Schlenker 2010, inter alia).
 - Some triggers are robust (Abusch's hard triggers, as in (6)), while others are variable (Abusch's soft triggers, Schlenker's part-time triggers, as in (7) and (8)).
6. If it is John who broke the copier, they'll be lenient. (#but I dont know whether anyone broke the copier)
 7. If Mary discovers that John is in NY, she will be angry. (but I dont know whether John is in NY)
 8. If Lance wins the Tour de France this year, it will be his 8th victory. (but I dont know whether he will enter)

Proposed Solution to Difficulty 1

There are multiple proposals for dealing with the first problem, including Roberts et al. 2009, Jayez 2010, and Simons et al. 2011. They share a number of predictions:

- Projective meanings are entailed in FoS contexts (this is their basis for being projective).
- Non-projective meanings are not entailed in FoS contexts.
- Projective meanings include both presupposition triggers and CI triggers (inter alia), whether because they are all at-issue or because they are the preferred site for attachment.
- Presuppositions and CIs should project equally (there is no basis for a difference in projection between them in not-at-issue contexts or as non-preferred attachment sites).

Proposed Solution to Difficulty 2

There are many theories that tackle projection variability, including Simons 2001, van der Sandt and Geurts 2001, Abbott 2006, Abusch 2002, 2005, 2010, and Schlenker 2010. Although there are a number of specific differences across these theories, they all share a number of predictions, including the following:

- Some triggers project across all contexts and FoS environments (hard triggers), including cleft sentences and additive particles like *too*.
- Some triggers do not project in certain contexts and FoS environments (soft triggers), including factives like *know* (most authors also agree that aspectual / preparatory phrase verbs like *stop* and *win* are soft triggers, but they are not specifically mentioned by all authors).

Predictions

Based on the theories mentioned so far, we have the following predictions at the most basic level:

- Projective meanings differ from non-projective meanings in that the former should project in FoS environments while the latter should not.
- Projective entailments should project just as much in basic environments as in FoS environments.
- Presuppositions and Conventional Implicatures, both being types of projective meanings, should project equally in FoS environments (though if presuppositions include both hard and soft triggers and CIs are uniformly hard triggers, we may expect CIs to project more as a category).
- Within presuppositions, if there are differences in degree of projection, hard triggers (cleft sentences) should be associated with a greater degree of projection in FoS environments than soft triggers (win, know).

Conditions

To test these predictions, we used a 2 by 2 factorial design featuring 4 conditions:

- Non-projective entailment in a basic environment
- Non-projective entailment in an FoS environment
- Projective entailment in a basic environment
- Projective entailment in an FoS environment

Triggers selected: CIs

Non-restrictive relative clauses (supplement):

- Lance is from Texas
- Lance is not from Texas
- Lance, who is from Texas, bikes
- Lance, who is from Texas, doesn't bike
- Q: How surprised would you be to learn that Lance is from Texas?

Epithets (expressive):

- I am angry at the guy who blabbed to my boss.
- I am not angry at the guy who blabbed to my boss
- That bastard blabbed to my boss.
- That bastard didn't blab to my boss.
- Q: How surprised would you be to learn that the speaker is angry at the guy who could have blabbed to his boss?

Triggers selected: Hard trigger

The cleft:

- The copier is broken
- The copier isn't broken
- It was Eva who broke the copier
- It wasn't Eva who broke the copier
- Q: How surprised would you be to learn that the copier is broken?

Triggers selected: Soft triggers

Know (weak factive):

- Juan is going home
- Juan is not going home
- Laura knows that Juan is going home
- Laura doesn't know that Juan is going home
- Q: How surprised would you be to learn that Juan is going home?

Win (verb with a preparatory phrase):

- Devon participated in the school raffle
- Devon didn't participate in the school raffle
- Devon won the school raffle
- Devon didn't win the school raffle
- Q: How surprised would you be to learn that Devon participated in the school raffle?

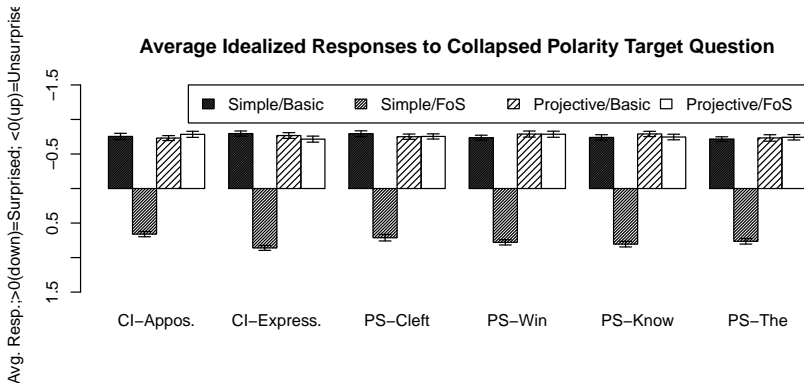
Triggers selected: The unknown/disputed

The existence presupposition of the definite article:

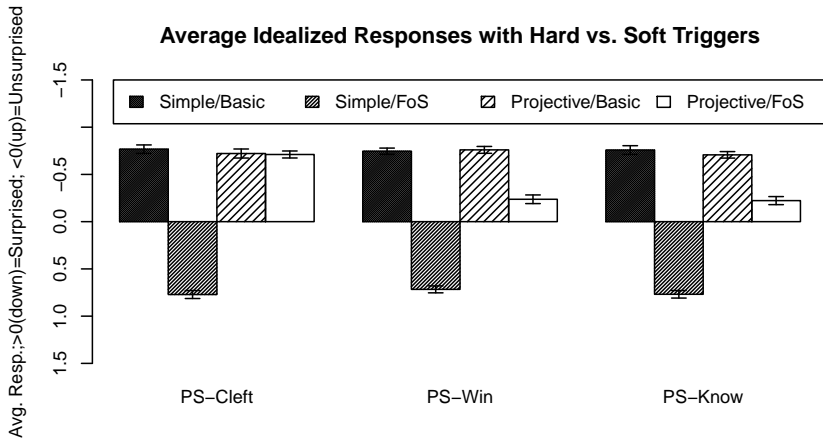
- There was a team MVP
- There wasn't a team MVP
- The team MVP got a medal
- The team MVP didn't get a medal
- Q: How surprised would you be to learn that the team had an MVP?

Some authors, such as Abusch, point to cancelability with possessives as potential evidence that definites are softies, though Abbott, for example, believes that examples of cancellation involve metalinguistic negation.

Predictions for projection of CIs and presuppositions



Predictions for presupposition heterogeneity



Experimental setup 1

[SURVEY PREVIEW MODE] Language Interpretation Experiment (Group A) Survey - Internet Explorer provided by Dell

http://www.surveymonkey.com/s.aspx?PREVIEW_MODE=DO_NOT_USE_THIS_LINK_FOR_COLLECTION&sm=bhm0ryfYuj5k10Eaoz5P3EZeO1C34G4ynb3%2bgOH

File Edit View Favorites Tools Help

Norton Norton Safe Search Search Cards & Log-ins

Language Interpretation Experiment (Group A) [Exit this survey](#)

10. Question 4

The Blackhawks will win the 2014 Stanley Cup.

How surprised would you be to learn . . .

1. ...that the Blackhawks won't participate in the 2014 Stanley Cup?

1 (Not at all surprised)
 2
 3 (Neither surprised nor unsurprised)
 4
 5 (Extremely surprised)

2. ...that the Blackhawks will change their mascot in the next 10 years?

1 (Not at all surprised)
 2
 3 (Neither surprised nor unsurprised)
 4
 5 (Extremely surprised)

3. ...that hockey is growing in popularity in the U.S.?

1 (Not at all surprised)
 2
 3 (Neither surprised nor unsurprised)
 4
 5 (Extremely surprised)

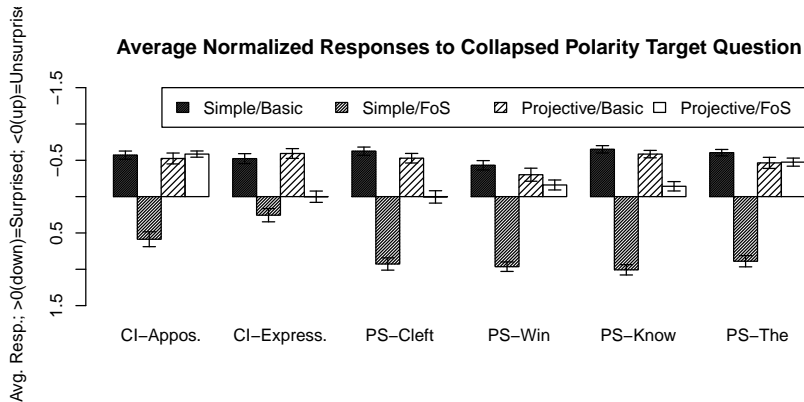
██████████ 19%

Prev Next

Experimental setup 2

- Results are from 53 native English speakers, all undergrads at Northwestern who earned course credit for participating.
- There were 36 critical stimuli (6 triggers x 3 environments x 2 polarities of question)
- Including filler trials and distractor questions, there were 132 questions total
- Fillers and distractor questions varied in polarity and likelihood of response
- They spent an average of 29 minutes on the task (ranging from 10 to 45)

Results Graph (Aggregate)



Significant Findings (Aggregate)

- Basic sentences (bars 1 and 3) are significantly different from 0 (do project).
- Simple FoS (bar 2) sentences are significantly different from 0 (don't project).
- Projective FoS (bar 4) sentences are significantly different from 0 (do project).
- Projective FoS sentences are significantly different from Simple FoS sentences (bars 2 and 4 are different, meaning that projective meanings do in fact project in FoS environments while simple meanings are indeed cancelled in FoS environments).
- Projective Basic sentences are sig. diff. from Projective FoS sentences (bars 3 and 4 are different, meaning that even though projective meanings are available in both basic and FoS contexts, they are MORE available in basic contexts than in FoS contexts).

Predictions Revisited

- Projective meanings should project in FoS environments while non-projective ones should not. TRUE
 $[p(609.76) = 21.02, p < 0.001]$
- Projective entailments should project just as much in basic environments as in FoS environments. FALSE; projective meanings project more in basic environments than in FoS environments
 $[p(631) = -6.47, p < 0.001]$
- Presuppositions and CIs should project equally in FoS environments (though if presuppositions include both hard and soft triggers and CIs are uniformly hard triggers, we may expect CIs to project more as a category). TRUE
 $[p(316) = -1.55, p = 0.12]$
- Within presuppositions, if there are differences in degree of projection, hard triggers (cleft sentences) should be associated with a greater degree of projection in FoS environments than soft triggers (win, know). FALSE
 $[p(84.4) = 1.60, p = 0.52]$

Trigger Comparisons

Within the various presuppositions, just looking at the projective meanings in FoS contexts (i.e., the 4th bars):

Not different:

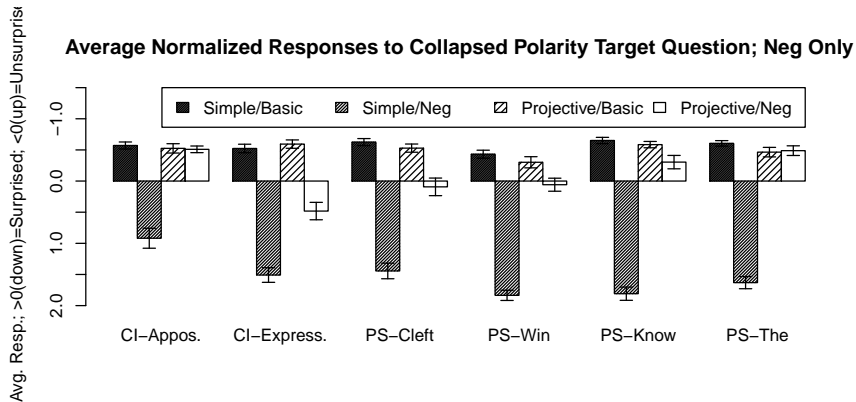
- Cleft vs. Win
- Cleft vs. Know
- Win vs. Know
- Hard vs. Soft

Significantly Different:

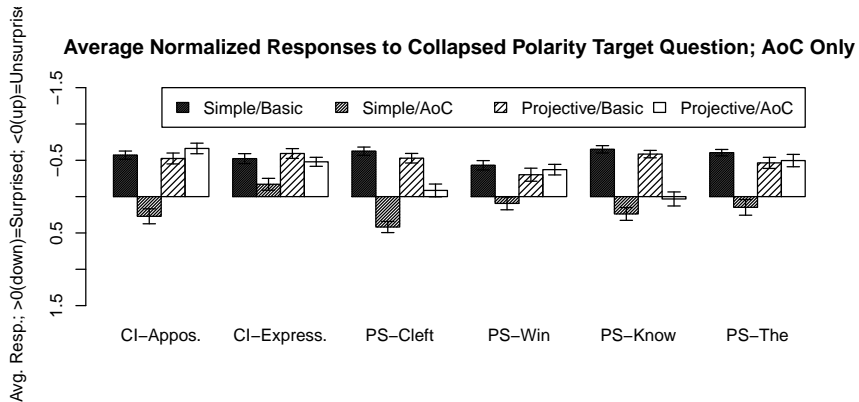
- Cleft vs. The
- Win vs. The
- Know vs. The
- Soft vs. The

Projective Appositives vs. Expressives are also significantly different from each other in FoS contexts (appositives project more than expressives.)

Negation Only



Antecedent of a Conditional (AoC) Only



Significant Findings (Negation)

All important results the same as the aggregate except:

- Conventional Implicatures don't project compared to 0. (This is probably because they do project in appositives but not in expressive, so they cancel out.)
- Projective "Know" and "The" aren't significantly different in the negation environment.
- Projective "Know" and "Cleft" are significantly different from each other in the negation environment.
- Projective "Know" and "Win" are significantly different from each other in the negation environment.

Significant Findings (AoC)

All important results the same as the aggregate except:

- There's no difference in how much Conventional Implicatures project in basic vs. AoC contexts (they project in both).
- Projective appositives and expressive aren't significantly different in the AoC environment.
- Conventional Implicatures and Presuppositions as a whole are now significantly different in the AOC context – CIs project more than PSs.
- Projective "Win" and "The" aren't significantly different in the AoC environment.
- Projective "Win" and "Know" are significantly different from each other in the negation environment.
- Projective "Win" and "Cleft" are significantly different from each other in the negation environment.

Future Work

We are currently following up in three ways:

- Adding context before these same stimuli, making them all not-at-issue
- Testing a wider variety of triggers (including different kinds of factives and auditory stimuli)
- Testing a wider variety of projection environments (and specific effects on certain triggers)

We see this as a first step, demonstrating variability, to be followed up by seeing whether we can constrain variability depending upon context.