Composition determines projection across modalities

Maria Esipova

New York University

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Posing the question

My research aims at explaining how different types of semantic content, spoken and gestural, pattern along a variety of dimensions, e.g., ability to address questions under discussion, behavior under ellipsis, or PROJECTION.

A piece of content PROJECTS when it gets interpreted outside the semantic scope of various operators despite appearing to be in their syntactic scope.

Posing the question

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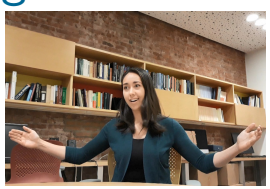
b. her dog, a large animal — APPOSITIVE

c. her dog[LARGE]  — CO-NOMINAL GESTURE

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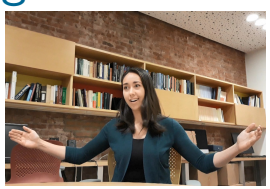
c. her dog[LARGE]  — CO-NOMINAL GESTURE

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What are the projection mechanisms illustrated in (1)?

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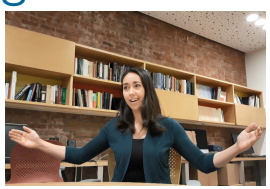
c. her dog$^{\text{LARGE}}$ 

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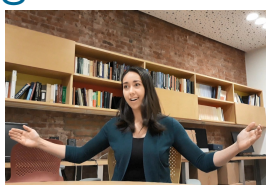
c. her dog$^{\text{LARGE}}$ 

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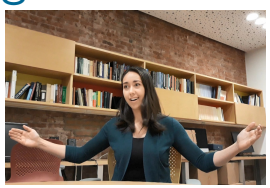
c. her dog[LARGE] 

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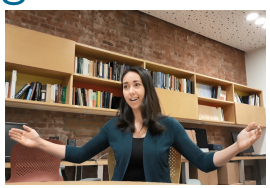
c. her dog$^{\text{LARGE}}$  — SUPPLEMENT? COSUPPOSITION?

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My proposal:

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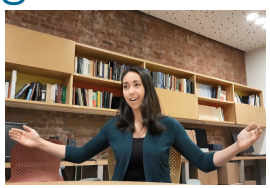
c. her dog[LARGE]  — SUPPLEMENT or NON-RESTRICTING MODIFIER

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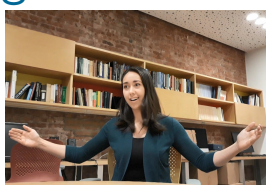
c. her dog$^{\text{LARGE}}$  — SUPPLEMENT or COSUPPOSITION

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My proposal: composition in the syntax/semantics (both for spoken expressions and compositionally integrated gestures).

Outline

Modification as a composition strategy

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E.g., *blond* in (2) is a modifier. It composes with the NP *stuntwoman* (type et) yielding a subset of its denotation, as evidenced by the SUBSECTIVE ENTAILMENT going through in (2).

(2) Zoe is a blond stuntwoman.
$\rightarrow$ Zoe is a stuntwoman.

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E.g., *(who is) a stuntwoman* in (3) is a supplement. It composes with the DP *Zoe* (type e) yielding the proposition that Zoe is a stuntwoman.

(3) I invited Zoe, (who is) a stuntwoman.

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Many accounts for supplement projection (e.g., Potts 2005; AnderBois et al. 2013; Koev 2013)—I will not propose a new one here.

Apparent exceptions to supplement projection (e.g., Schlenker 2013; Jasinskaja & Poschmann 2018) don't apply to the cases discussed here.

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E.g., if you have the relevant world knowledge, you know that *female* is restricting in (5a) and non-restricting in (5b).

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Supplements don't have the compositional potential to restrict their anchors, so they are NON-RESTRICTIVE. (Following AnderBois et al. 2013, I take the apparent exceptions discussed in Wang et al. 2005; Nouwen 2014 not to be such.)

Non-restricting modifiers and projection

Non-restricting modifiers (NRM) are truth-conditionally vacuous (Leffel 2014, examples adopted from there):

(6) a. I will eliminate every harmful chemical.
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Instead, NRMs give rise to strongly projecting inferences that all members of the input set satisfy the modifier's description, NRM INFERENCES.

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a. *...They have agreed that they need a car, no matter how big. Lucy:*
?Well, Pam is coming from Boston. I don't know if she has a car, but if she's coming in her car, we can use it to get to the camping site.
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b. *...They have agreed that they need a large car to fit all their supplies. Lucy knows that Pam has a car. Lucy:*
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Local interpretations of (weak) presuppositions are standardly derived via LOCAL ACCOMMODATION (e.g., Heim 1983; Schlenker 2009).
Local accommodation saves the day in (7a), but not in (7b).

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- We need to make sure this mechanism doesn't allow for local accommodation of NRM inferences.

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- What about co-nominal gestures? Are they more like adjectives or more like appositives?

Experiment: design

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- Items:

		Interpretation		
		Projecting non-restricting	*Restricting*	*Non-projecting non-restricting*
Content Type	*Adjective*	4	4	4
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- Each participant saw 1 randomly selected item per condition and 2 additional check items.

Experiment: design

Typical trial:

Context: We are going on a group tour. Anna and Maria are responsible for renting a van. Maria just told Anna that **Stephanie, who has two pets, a small cat and a large dog**, is planning to bring along one of her pets. **Anna, who has seen both Stephanie's pets before**, says:

Given the context, how natural is the sentence in the video?

Totally unnatural Totally natural

Drag the slider

>>

Experiment: design

(8) *Context: We are going on a group tour. Anna and Maria are responsible for renting a van. Maria just told Anna that...*

a. PROJECTING NON-RESTRICTING *...Stephanie, who has two pets, a small cat and a large dog, is planning to bring along one of her pets. Anna, who has seen both Stephanie's pets before, says:*
Do you know which one of Stephanie's pets is coming with us?
'Cause if she's bringing...
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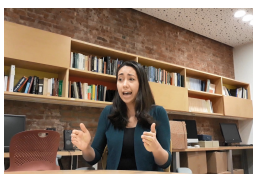
(iii) her **cat**$^{\text{SMALL}}$  GESTURE
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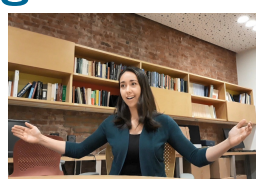
(iii) her **dog**$^{\text{LARGE}}$ 
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(8) b. RESTRICTING *...Stephanie, who has two dogs, a small Pug and a large Great Dane, is planning to bring along one of her dogs. Anna, who has seen both Stephanie's dogs before, says:*
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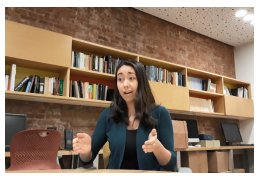
(iii) her **dog**$^{\text{SMALL}}$  — GESTURE
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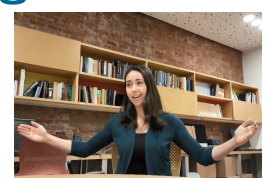
(iii) her **dog**$^{\text{LARGE}}$ 
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Experiment: design

(8) c. NON-PROJECTING NON-RESTRICTING *...Stephanie is planning to bring along her dog. Anna knows that Stephanie only has one dog, but has never seen it. She says:*

Do you know how big Stephanie's dog is? 'Cause if she's bringing...

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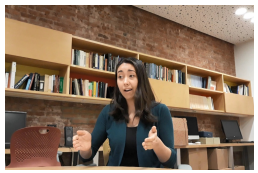
(iii) her **dog**$^{\text{SMALL}}$  GESTURE

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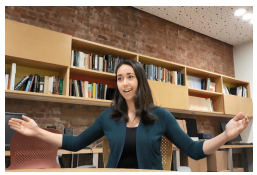
(iii) her **dog**$^{\text{LARGE}}$ 

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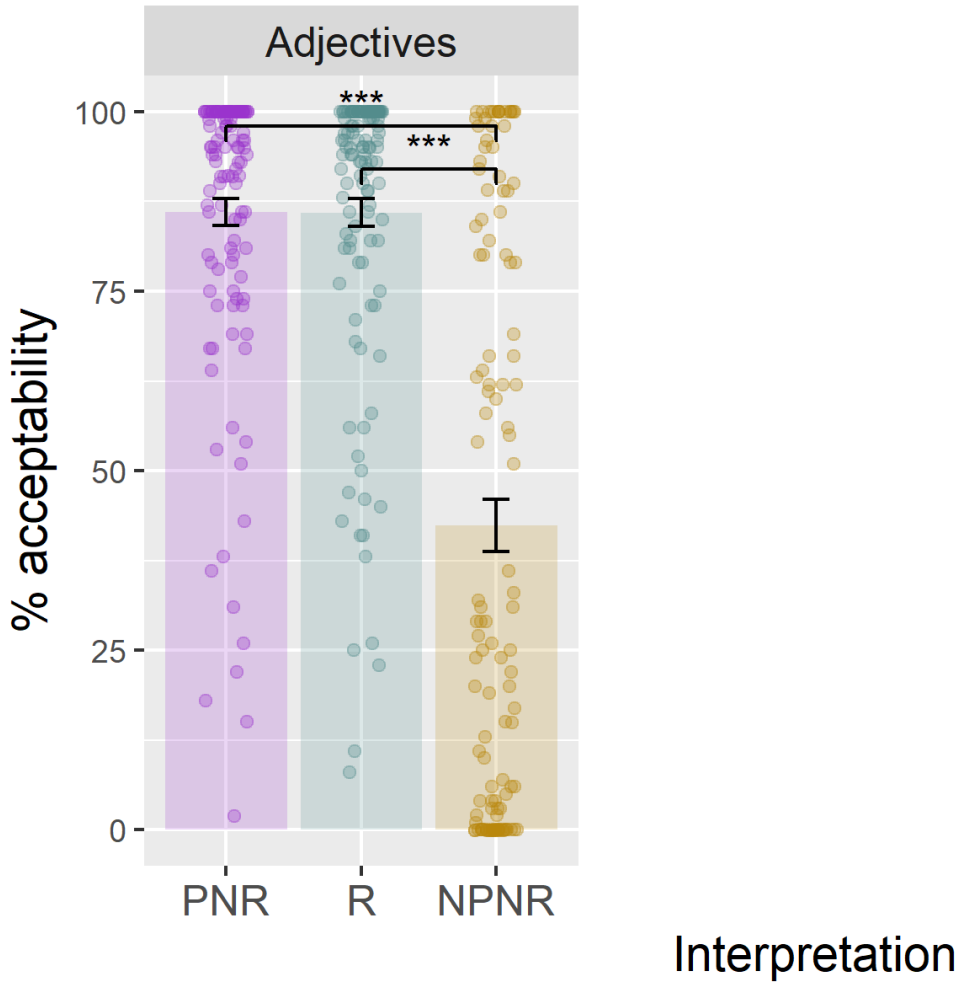

Fig. 1: % acceptability of the 3 interpretations for each content type. Error bars show standard error. Dots represent individual responses (with minor jitter added).

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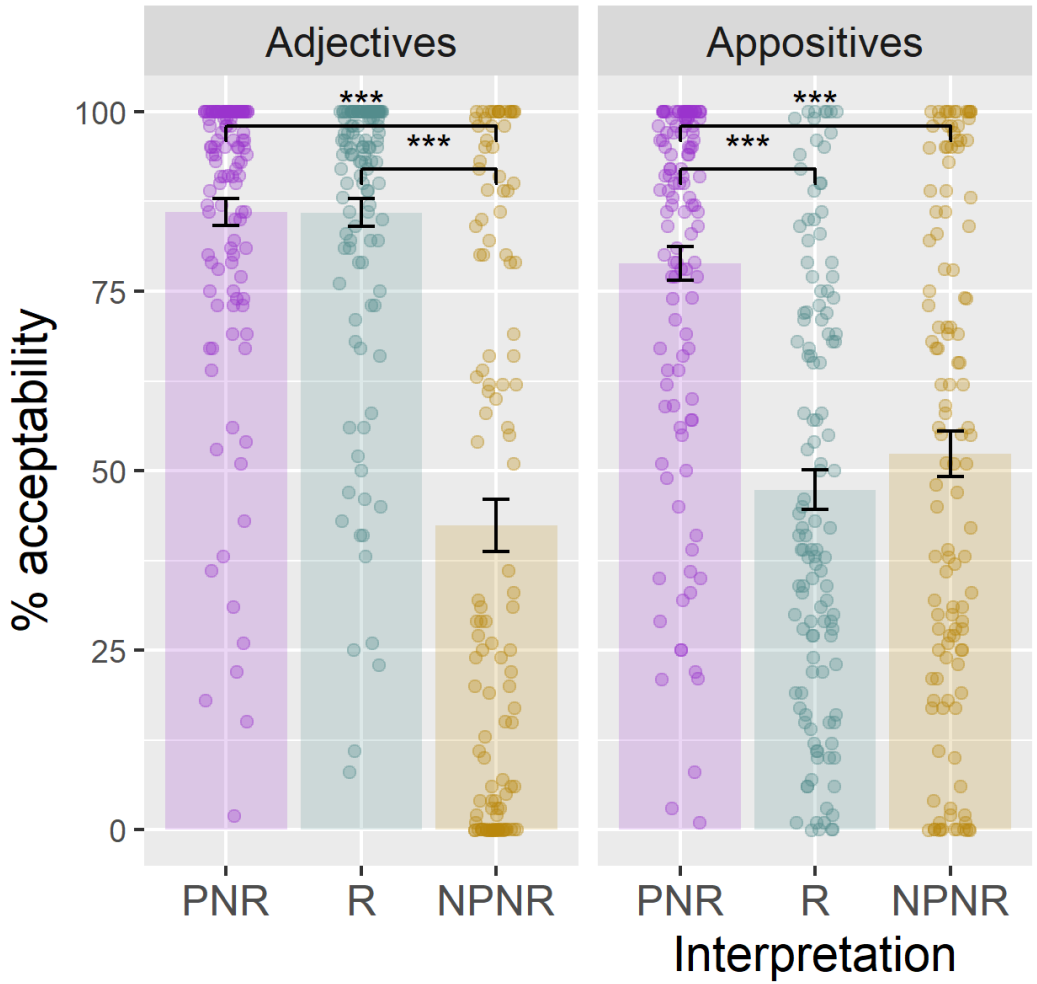

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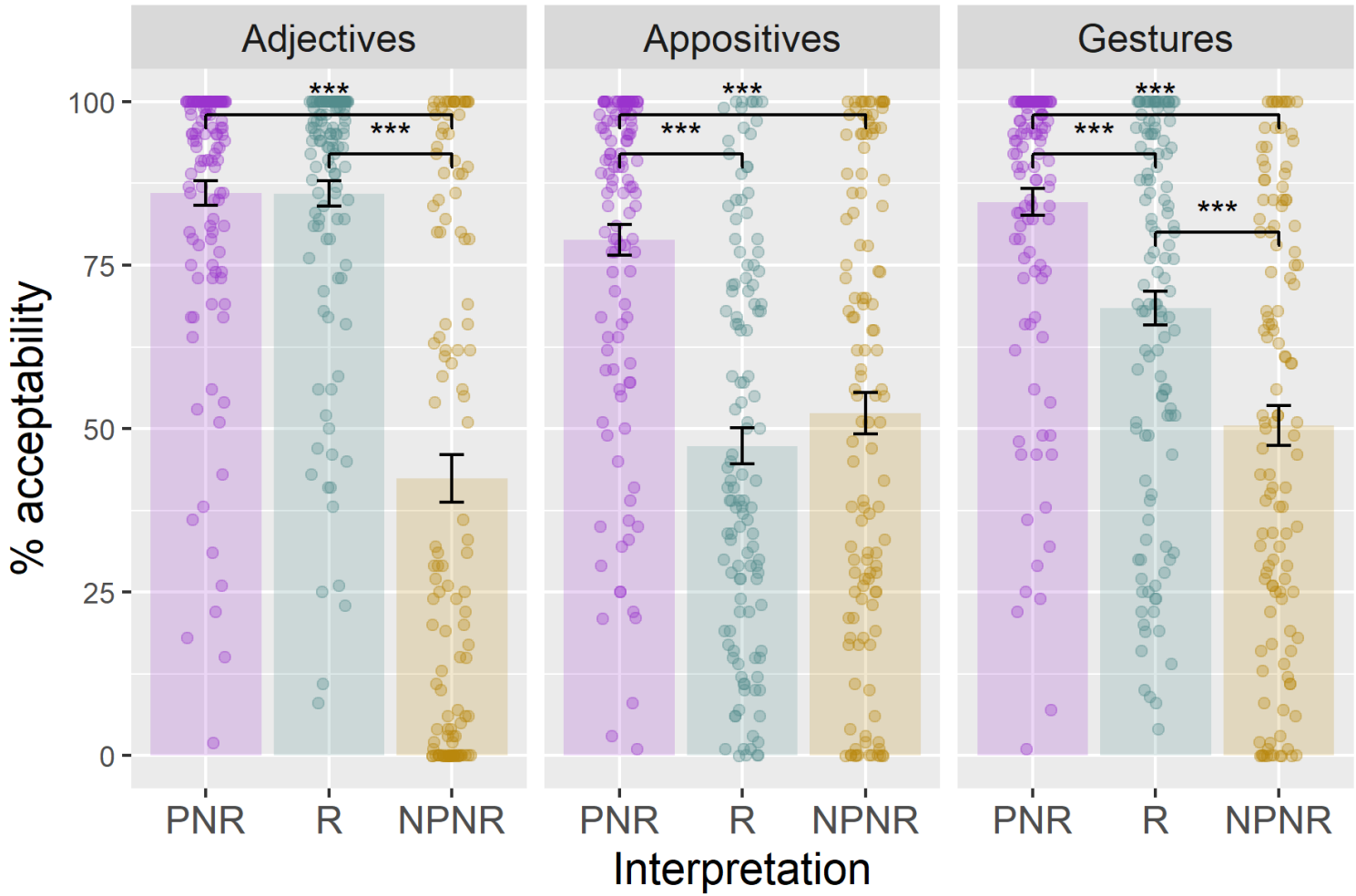

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The addition of "exemplification" uses of co-speech gestures in Ebert 2017 doesn't help generate restricting interpretations either.

Cosuppositional analysis of co-speech gestures (Schlenker 2018)

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- S, G, and c' have to be of the same semantic type, so it matters where the gesture adjoins.

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$\forall x.(\text{bring}(\text{s}, x) \wedge \text{poss}(\text{s}, x)) \rightarrow (\text{dog}(x) \rightarrow \text{large}(x))$
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f. local accommodation $(S\,\&\,(S \Rightarrow G))$:
$\lambda x.\text{dog}(x) \wedge \text{large}(x)$ 'being a large dog'
We proceed with the derivation as usual and get:
$\text{bring}(\iota x.\text{dog}(x) \wedge \text{large}(x) \wedge \text{poss}(\text{s}, x))$
'Stephanie brings her large dog.' ✓

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b. Attempt 1, DP-level gestures denote existential quantifiers:

(i) gesture G:
$[\![\text{LARGE}_{\text{DP}}]\!] = \lambda P.\exists x[\text{large}(x) \wedge P(x)]$ 'a large object'

(ii) local accommodation $(S \,\&\, (S \Rightarrow G))$, end result:
$\text{bring}(\text{s}, \iota x.\text{dog}(x) \wedge \text{poss}(\text{s}, x)) \wedge \exists x[\text{large}(x) \wedge \text{bring}(\text{s}, x)]$
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c. Attempt 2, DP-level gestures are anaphorically linked to the DPs they adjoin to:
(i) gesture G:
$[\![\text{LARGE}_{\text{DP}i}]\!]^g = \lambda P.P(g(i)) \wedge \text{large}(g(i))$ 'that object, and it is large'
(ii) local accommodation $(S \,\&\, (S \Rightarrow G))$, end result:
$\text{bring}(\text{s}, \iota x.\text{dog}(x) \wedge \text{poss}(\text{s}, x)) \wedge \text{large}(\iota x.\text{dog}(x) \wedge \text{poss}(\text{s}, x))$
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Proposal: composition determines projection across modalities

Applying Schlenker's cosuppositions to DP-level gestures forces us to compose them conjunctively with the DPs they adjoin to, but no spoken DP-level adjuncts do that.

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- This view is compatible with late lexical insertion.

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But, following Schlenker 2018a, co-speech gestures prefer to be truth-conditionally vacuous due to their secondary modality nature. Thus, modifier gestures prefer to be non-restricting; this preference can be overridden to a gradient and variable extent.

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So, gestural NRM inferences project in the same way as other NRM inferences. But what is this way?

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I re-conceptualize Schlenker's cosuppositions as NRM inferences cross-modally.

Cosuppositions as inferences of non-restricting modifiers

A tweak: in $[_{\beta}\ [\text{NRM}\ ][_{\alpha}\ ]]$, let's switch from cosuppositions of the form $\alpha \Rightarrow \text{NRM}$ to $\alpha \Rightarrow \beta$—which is a generalized definition of non-restricting modification.

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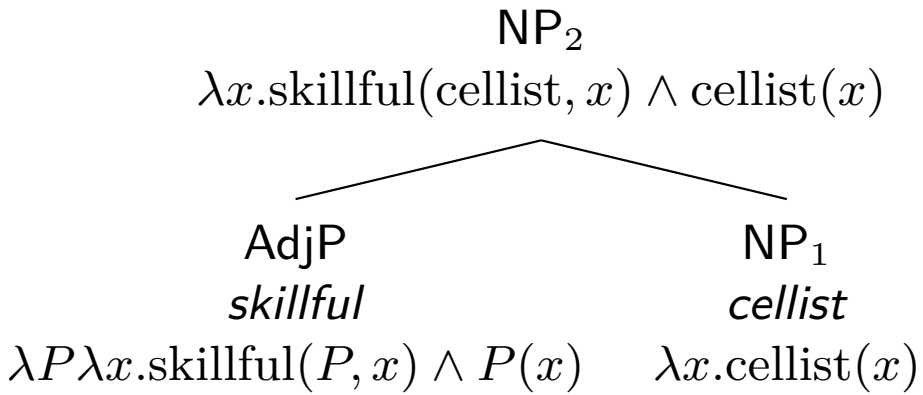

b. cosupposition $\text{NP}_1 \Rightarrow \text{NP}_2$:
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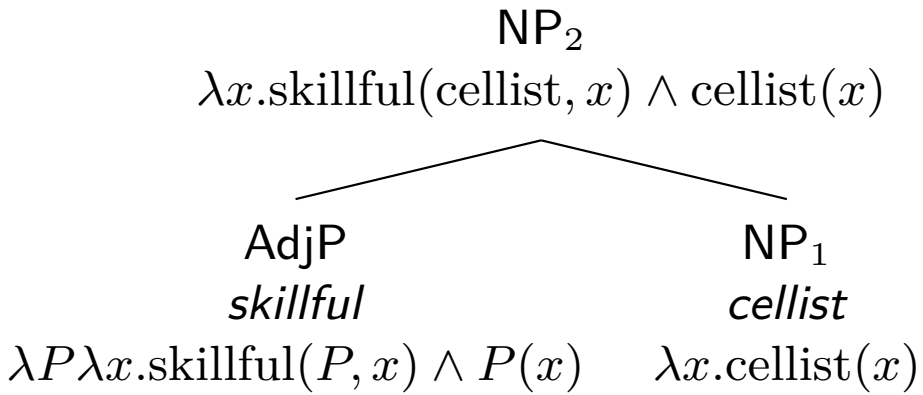

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This view of cosuppositions actually works better for some cases discussed by Schlenker (2018b) himself.

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Now we have a general mechanism for projecting NRM inferences in place, which we can apply to other types of content, such as *phi*-features on pronouns, various iconic geometric properties of gestures/signs, modifiers in the verbal domain.

Conclusion: summary

I have applied a composition-driven approach to projection of co-nominal gestures, accounting for how they can(not) be interpreted without any gesture-specific composition or projection rules.

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- We should use the composition-driven approach as a general heuristic for other types of non-sublexical content that can or have to project.

Conclusion: summary

I have applied a composition-driven approach to projection of co-nominal gestures, accounting for how they can(not) be interpreted without any gesture-specific composition or projection rules.

Two programmatic take-home points:

- We should use the composition-driven approach as a general heuristic for other types of non-sublexical content that can or have to project.
- If we want to approach gestures as linguistic objects, we should do so at all levels of representation.

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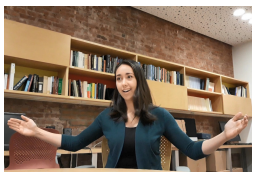

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Co-nominal gestures: empirical picture

Results (stats):

Table 1: % acceptability of different interpretations for each content type: statistics.

Content	**Mean % acceptability**			**Comparisons**		
	PNR	R	NPNR	PNR/R	PNR/NPNR	R/NPNR
Adjectives	86.0	85.9	42.4	NS Beta = .001 t = .03 p = .976	*** Beta = .565 t = 10.71 p < 2e−16	*** Beta = .568 t = 10.842 p < 2e−16
Appositives	78.9	47.4	52.4	*** Beta = .49 t = 10.35 p < 2e−16	*** Beta = .398 t = 8.057 p = 6.28e−13	NS Beta = −.077 t = −1.628 p = .106
Gestures	84.6	68.4	50.5	*** Beta = .301 t = 6.298 p = 5.43e−09	*** Beta = .513 t = 10.95 p < 2e−16	*** Beta = .277 t = 5.459 p = 2.59e−07

Proposal: *phi*-features on pronouns as obligatorily non-restricting modifiers

Person and number work analogously to gender; the cosuppositions are computed for each modifier ($X_1 \Rightarrow X_2$, $X_2 \Rightarrow X_3$, and $X_3 \Rightarrow X_4$):

(12)