

## Composition determines projection across modalities

**Overview** The current consensus in the literature is that the content contributed by gestures co-occurring with speech, *co-speech gestures*, as in (1), tends to project from under semantic operators (e.g., Ebert & Ebert 2014; Tieu et al. 2017, 2018; Schlenker 2018).

- (1) If Stephanie’s bringing her dog<sup>LARGE</sup>, we should get a bigger van.<sup>1</sup>  
→ Stephanie’s dog is large.

But there is no consensus on what assures said projection. Ebert & Ebert (2014) claim that co-speech gestures are akin to appositives and project as such. Schlenker (2018) argues that co-speech gestures trigger special presuppositions, *cosuppositions*. I show that neither analysis can on its own account for all (un)available interpretations of co-nominal gestures and propose an alternative, whereby how gestures project is determined by how they compose.

**Interpretations of adnominal adjuncts: experiment** Design MTurkers ( $N = 122$ ) watched videos of sentences uttered in various contexts and rated them on a scale from ‘Totally unnatural’ to ‘Totally natural’ (mapped to 0–100). The items differed across content type (adjective, appositive, gesture) and interpretation (projecting non-restricting (PNR), restricting (R), non-projecting non-restricting (NPNR)). A sample paradigm is given in (2).

- (2) *Context: We are going on a group tour. A. and M. are responsible for renting a van. M. just told A. that...*

a. *PNR: ...Stephanie, who has two pets, a small cat and a large dog, is planning to bring along one of her pets. A., 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 (i) her small **cat** / (ii) her **cat**, a **small** animal / (iii) her **cat**<sup>SMALL</sup>, we’ll be fine, but if she’s bringing (i) her large **dog** / (ii) her **dog**, a **large** animal / (iii) her **dog**<sup>LARGE</sup>, we should get a bigger van.

b. *R: ...Stephanie, who has two dogs, a small Pug and a large Great Dane, is planning to bring along one of her dogs. A., who has seen both Stephanie’s dogs before, says:*

Do you know which one of Stephanie’s dogs is coming with us? ‘Cause if she’s bringing (i) her **small** dog / (ii) her dog, a **small** animal / (iii) her **dog**<sup>SMALL</sup>, we’ll be fine, but if she’s bringing (i) her **large** dog / (ii) her dog, a **large** animal / (iii) her **dog**<sup>LARGE</sup>, we should get a bigger van.

c. *NPNR: ...Stephanie is planning to bring along her dog. A. 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 (i) her **small** dog / (ii) her dog, a **small** animal / (iii) her **dog**<sup>SMALL</sup>, we’ll be fine, but if she’s bringing (i) her **large** dog / (ii) her dog, a **large** animal / (iii) her **dog**<sup>LARGE</sup>, we should get a bigger van. [Intended: ‘...if (Stephanie’s dog is large and she’s bringing her dog)...’]

**Results and discussion** The results are given in Fig. 1. The contrast between appositives and gestures wrt restricting interpretations suggests that the appositive-like strategy cannot be the only interpretation strategy available to co-speech gestures, contra Ebert & Ebert 2014.

**Cosuppositions of NP- and DP-level gestures** Schlenker’s (2018) cosupposition strategy, given in (3), isn’t sufficient either. Given the right assumptions, the mechanism yields good results for NP-level (type *et*) gestures, as shown in (4). Local accommodation of such gestures makes the desirable restricting interpretation possible. But, allowing local accom-

<sup>1</sup> In ‘word<sup>GESTURE</sup>’ GESTURE co-occurs with *word*. **Bold** indicates prosodic contrastive focus marking.

modation for DP-level (type  $\langle et, t \rangle$ ) gestures yields unattested interpretations, no matter the assumptions. For example, if in *Stephanie brings*  $[[_{\text{DP}} \textit{her dog}]^{\text{LARGE}}]$  the gesture denotes something like ‘a large object’, conjoining it to the DP *her dog* will result in a completely unattested interpretation ‘Stephanie brings her dog and a large object’. Introducing an anaphoric link between *her dog* and the gesture yields the non-projecting non-restricting interpretation (see (5)), shown to be unavailable by the experiment above. Thus, if we wanted to maintain that the cosupposition strategy is the only one available to co-speech gestures, we would either have to say that local accommodation can apply to NP-, but not DP-level gestures, or that co-nominal gestures can’t adjoin to DPs. Neither option seems motivated.

- (3) Cosupposition of  $[[S]^G]$
- a.  $S$ : spoken expression    b.  $G$ : gesture     $c'$ : pragmatic local context (Schlenker 2009)
  - d. projection:  $c' \Rightarrow (S \Rightarrow G)$  ( $\Rightarrow$  is generalized entailment)
  - e. local accommodation:  $S \& (S \Rightarrow G)$ , i.e.,  $S \& G$  ( $\&$  is generalized conjunction)
- (4) Stephanie brings her  $[[_{\text{NP}} \textit{dog}]^{\text{LARGE}}]$ .
- a.  $[[S]] = \lambda x. \text{dog}(x)$     b.  $[[G]] = \lambda x. \text{large}(x)$     c.  $[[c']] = \lambda x. \text{bring}(s, x) \wedge \text{poss}(s, x)$
  - d. projection:  $\forall x. (\text{bring}(s, x) \wedge \text{poss}(s, x)) \rightarrow (\text{dog}(x) \rightarrow \text{large}(x))$
  - e. local accommodation:  $\lambda x. \text{dog}(x) \wedge \text{large}(x)$
- (5) Stephanie brings  $[[_{\text{DP}} \textit{her dog}]_i^{\text{LARGE}_i}]$ .
- a.  $[[S_i]]^g = \lambda P. P(\lambda x. \text{dog}(x) \wedge \text{poss}(s, x))$     b.  $[[G_i]]^g = \lambda P. P(g(i) \wedge \text{large}(g(i)))$
  - c. local accommodation:  $\lambda P. P(\lambda x. \text{dog}(x) \wedge \text{poss}(s, x)) \wedge \text{large}(\lambda x. \text{dog}(x) \wedge \text{poss}(s, x))$

**Proposal: composition determines projection** But how do gestures compose?

No gesture-specific composition I propose that syntax and semantics proper are modality-blind, i.e., when gestures compositionally integrate into utterances, they do so just like spoken content. Any modality-specific effects arise in pragmatics or phonology and its interfaces.

Two composition strategies exist in the nominal domain; both are available to gestures. *Modifiers*, such as adjectives, adjoin to NPs in the syntax. Semantically, they compose with sets of entities and return subsets thereof, i.e., modifiers are *restrictive*, but not necessarily proper subsets, i.e., modifiers aren’t always *restricting*. Non-restricting modifiers are truth-conditionally vacuous, but give rise to strongly projecting inferences about all the elements of the input set. I re-purpose Schlenker’s cosuppositions as a modality-neutral mechanism yielding such inferences. *Supplements*, such as appositives, adjoin to DPs and contribute obligatorily projecting propositional content about them; they aren’t restrictive and thus can’t be restricting. Any existing implementation will do (e.g., Potts 2005; Koev 2013).

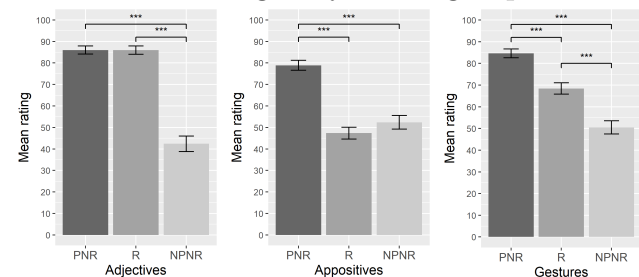


Fig. 1: Acceptability ratings of different interpretations for different content types.

Non-restricting gestures preferred I follow Schlenker in that there is a pressure for co-speech gestures to be truth-conditionally vacuous. So, modifier co-nominal gestures prefer to be non-restricting. The pragmatic nature of this preference allows for gradience and variability in acceptability of restricting co-speech gestures, in line with the data above and in Esipova To appear.

**References** Ebert & Ebert. 2014. *SPE* 7. Esipova. To appear. *Glossa*. Koev. 2013. PhD thesis. Potts. 2005. OUP. Schlenker. 2009. *S&P* 2(3); 2018. *L&P* 41(3). Tieu et al. 2017. *Glossa* 2(1); 2018. *Glossa* 3(1).