

## The role of linear order in presupposition projection

**Intro:** Presupposition filtering and its (a-)symmetries raise foundational questions about linear order in interpretation. Chierchia (2009) introduced restrictor extraposition with quantifiers as a test case. In the meaning-centered tradition (Heim 1983), the different linear orders due to extraposition are uniform in filtering, as the structures have the same meaning. On a linear approach, different linearizations diverge in filtering patterns despite the overall same meaning (Schlenker 2008, 2009; Chemla & Schlenker 2012 a.o.). Finally, a recent ‘intermediate’ approach of Kalomoiros (2023) operates incrementally on linear order but *modulates* its effects based on truth conditional meaning, yielding predictions partially aligning with each of the above approaches. We experimentally test effects of restrictor extraposition with *every*, systematically manipulating linear order while keeping the meaning constant. We find no effect of linear order. This challenges the linear approach, but is in line with both the meaning-centered and the intermediate approach. We conclude with some discussion on how the latter two approaches can be differentiated in the future.

**Restrictors:** Quantificational structures in English allow restrictors to appear either before their scope (1b), or (partly) after, e.g., with extraposed relative clauses (1c). Presupposition in the scope of a quantifier can be filtered when entailed by the restrictor: on all views, the presupposition of (1b) amounts to the tautological *Every teacher who did cardio yesterday exercised before today*. In (1c), however, predictions come apart: on the linear approach, where presuppositions must be resolved as soon as they are encountered in the parse, the presupposition strengthens to *Every teacher exercised before today*. While this type of approach commonly allows global consideration of later material as well - meaning that the extraposed restrictor in (1c) can be used for filtering -, this option has been argued to incur processing costs corresponding to decreased acceptability ratings (Chemla & Schlenker 2012 a.o.). No such costs apply in (1b), so an asymmetry between (1b) vs. (1c) is predicted. Conversely, on the meaning-centered approach, the extraposition manipulation should not matter, as (1b) and (1c) have the same overall interpretation with the same tautological presupposition. Predictions of the intermediate approach vary by quantifier; for *every* they are equivalent to those of the meaning-based approach.

**Design:** Adapting the general approach of Mandelkern et al. 2020, we tested the difference in contextual acceptability between sentences like (1b) vs (1c). All our stimuli used *every* and were constructed around 3 triggers, *too*, *again*, *re-*. Tracking where the trigger appears relative to the restrictor, we dub the condition in (1b) PsSecond, and the one in (1c) PsFirst. All stims appeared in two kinds of context: Explicit Ignorance (EI) contexts denied knowledge of the relevant presupposition (see bolded part of (1a-EI)). This ensured that a potential presupposition that *Every teacher exercised before today* - predicted by the linear approach for (1c) - would decrease acceptability. Conversely, Support (S) contexts explicitly supported this presupposition (see bolded part of (1a-S)). Potential differences between (1b) vs. (1c) in S contexts control for other factors (in particular, potential costs of extraposition). Potential differences going beyond that in EI contexts would then point to the presupposition predicted by the linear approach. The final condition, exemplified in (2b), provided another baseline, where no filtering is possible. Thus, in EI contexts, the only way to avoid projection is to appeal to a (presumably less acceptable) option of non-global accommodation. Conversely, in S contexts this isn’t needed (since the presupposition is already supported). The difference in acceptability of (2b) in EI vs S contexts then provides a baseline for the potential availability and cost of non-global accommodation in critical stimuli.

**Procedure:** 200 participants recruited on Prolific were presented with 24 critical context-sentence pairs (plus 24 fillers) and were asked to judge how natural the sentence sounded in the given context on a 1-7 scale. Full details in the preregistration [here](#).

**Prediction and results:** All approaches sketched above predict that to some extent the presupposition of PsFirst can be filtered (though with some cost on the linear approach). This means that the difference between EI-PsFirst vs EI-PsSecond should be less than the difference between the baseline controls EI-NoFilt vs S-NoFilt where no filtering is possible for EI, predicting a statistical interaction. The results summarized in Fig 1 suggest such an interaction, which is confirmed in an ordinal mixed effect model analysis (with random slopes) ( $p < .01$ ).

Unlike the meaning-based and the intermediate accounts, the linear account also predicts EI-

PsFirst to be worse than EI-PsSecond - beyond any potential costs of extraposition that would also show up in the S-contexts. The linear approach then predicts an interaction based on a larger difference between First vs Second in EI contexts compared to S contexts. We find no such interaction in a  $2 \times 2$  mixed effect model of these conditions ( $p = 0.7$ ). To further assess this null effect, we also conducted a Bayesian analysis, using the results of Mandelkern et al. 2020 to extract priors for the relevant interaction. A Bayes factor analysis comparing a model for our data that included the relevant interaction and a null model that did not revealed extreme evidence in favor of the null model ( $BF_{10} < 0.01$ ) (Jeffreys 1939).

**Discussion and conclusion:** Our results challenge the linear approach, and vindicate a key intuition put forward in Chierchia 2009 in favor of meaning-based perspectives. However, given that at least some data in the literature point to effects of linear order (Mandelkern et al 2020, Kalomoiros et al 2024), it's interesting that the intermediate approach can also predict our data. Crucially though, the meaning-based and intermediate approaches make diverging predictions for other quantifiers, like *no*. Space constraints prevent us from fully unpacking this prediction, but crucially the intermediate approach predicts that extraposition should matter for *no* but not for *every*, while the meaning-based approach treats them on par. We are currently testing this novel prediction and will discuss results in the talk.

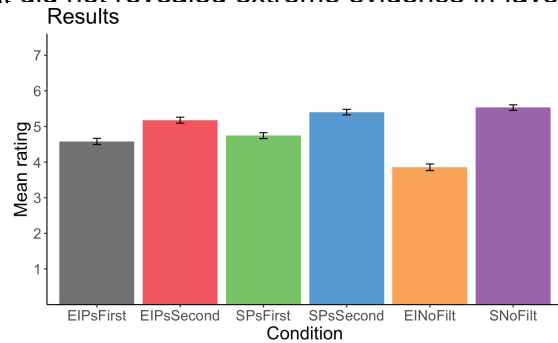


Figure 1: Results

- (1)
  - a. *Context:* At our school, there was a new initiative to include exercise in teachers' schedules. The schedule comes in two versions: the first includes exercise on only one day, the second is spread out across multiple days. The initiative just started yesterday...  
*EI:...* I know that some of the teachers did cardio yesterday, although **I have no idea if every teacher exercised in some way...**  
*S:...* I know that all the teachers exercised yesterday, and some of them did cardio...  
 ...I was wondering if any teachers signed up for the multiple-days version. Today, I learned that:
    - b. Every teacher who did cardio yesterday exercised **again** today. (PsSecond)
    - c. Every teacher exercised **again** today, who did cardio yesterday. (PsFirst)
  - (2)
    - a. *Context:* At our school, there was a new initiative to introduce exercise in teachers' schedules. There are two different versions of this schedule. One version includes exercise on only one day, the other across multiple days. This initiative started yesterday, and...  
*EI:...* some of the teachers exercised; but **I don't know if every teacher exercised in some way...**  
*S:...* and I know that every teacher exercised...  
 ...I was wondering if any teachers signed up for the multiple-days version. Today, I learned that:
      - b. Every teacher exercised again today. (NoFilt)

**References** • Chierchia, G. (2009) On the explanatory force of dynamic theories of presuppositions • Schlenker, P. (2008). Be Articulate: a pragmatic theory of presupposition projection • Schlenker, P. (2009). Local contexts • Heim, I. (1983) On the projection problem for presuppositions • Chemla, E. & Schlenker, P. (2012). Incremental versus Symmetric accounts of presupposition projection. • Fox D. & Nissenbaum J. (1999) Extraposition and scope: a case for overt QR • George, B. 2008. A new predictive theory of presupposition projection. • Jeffreys H. 1939. Theory of Probability. • Kalomoiros, A. 2023. Presupposition and its (A-)symmetries. • Mandelkern, M., Zehr, J., Romoli, J., & Schwarz, F. (2020). We've discovered that projection across conjunction is asymmetric (and it is!)