

Introduction

- Are there distinct neural generators associated with interpreting "**some**" as "**some, and not all**"?
 - Left IFG implicated in fMRI (Shetreet et al., 2013)
 - Effects at the scalar quantifier have not been observed in EEG (Hartshorne et al., 2013; c.f. Nieuwland et al., 2010)
- Present study: measure neural responses to *some* in inference-supporting and inference-nonsupporting contexts using the high temporal and spatial resolution of MEG

Methods

- Materials:** 128 target vignettes, contrasting Context ("all" vs. "any") and Explicitness ("some" vs. "only some"):
 - Mary was preparing to throw a party for John's relatives. She asked John whether (all/any) of them were staying in his apartment. John said that (only some / some) of them were.**
 - (**all** encourages hearer to infer "some+>not all"; **any** does not; Breheny et al., 2006)
 - Fillers: 144 with same structure, but other quantifiers (*all, many, none, several, a few, most, cardinals*)
- Procedure:** Sentences presented auditorily to 15 native English speakers (4 later removed), comprehension questions on 33% of trials. MEG recorded with 208 axial gradiometers, triggers time-locked to onset of *some*.
- Preprocessing:** CALM noise reduction (Adachi et al.), automatic thresholding and manual artifact rejection, 40 Hz LPF, baseline-corrected 200 ms pre-stimulus interval; minimum norm solutions generated on BESA template brain which was co-registered to each participant's fiducials and headshape. Brain parcellated into regions based on anatomical landmarks using Tailarach Daemon (tailarach.org)

Sensor-space results

No effects of context at the onset of *some* (spatiotemporal clustering $ps > .33$)

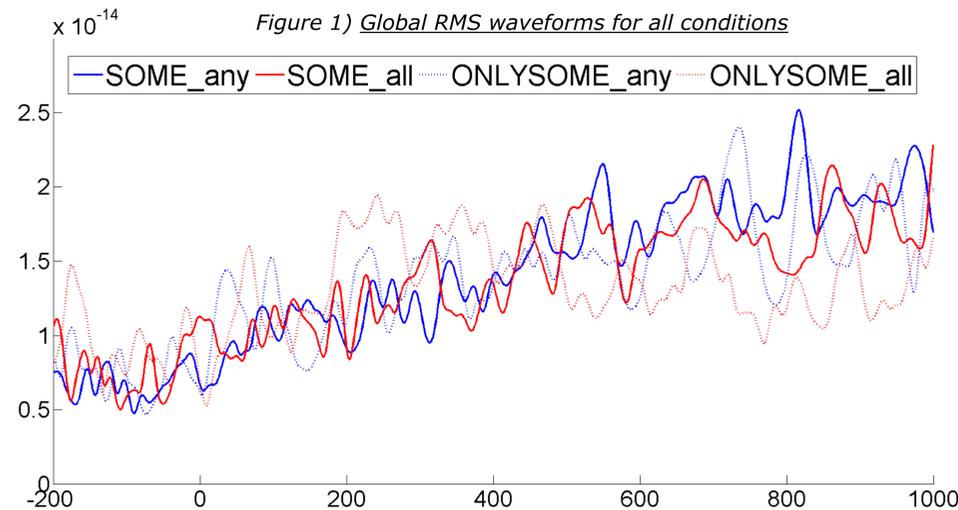
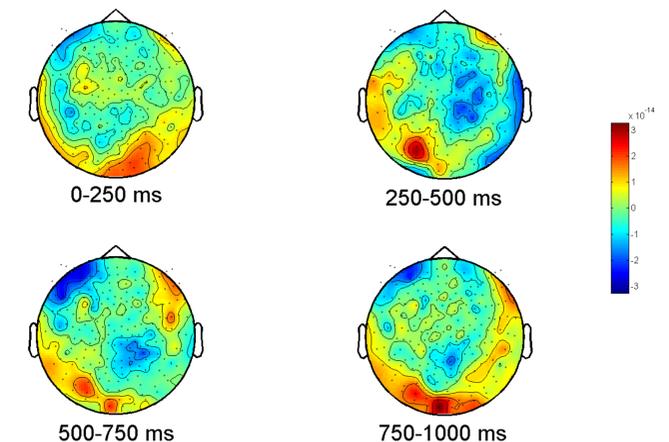
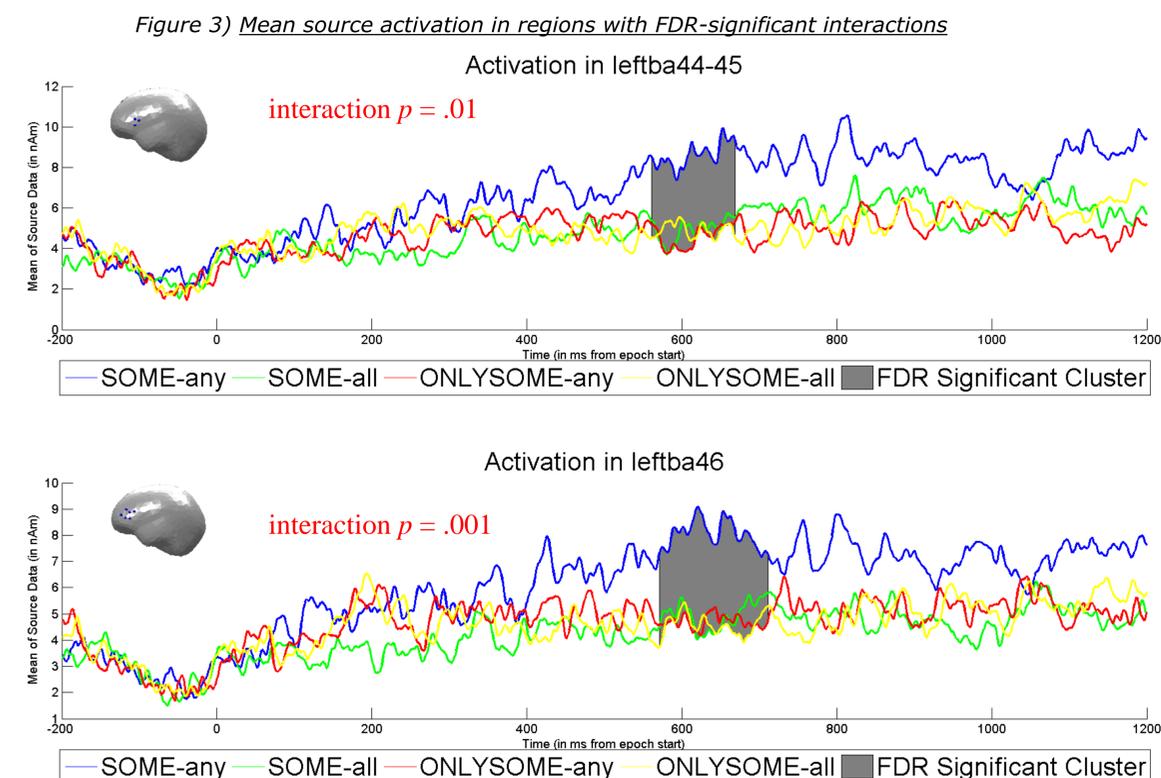


Figure 2) Topographic maps of SOME-any – SOME-all



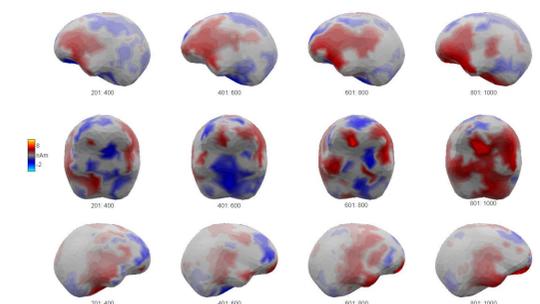
Source-space results

- Analysis:** Picked largest cluster in each ROI using temporal clustering (Maris & Oostenveld, 2007), then corrected false discovery rate of p-values across all ROIs (Benjamini and Yekutieli, 2001)



- ROIs (bilateral):**
 - IFG/MFG (BAs 44, 45, 46)
 - vmPFC (BAs 10, 11)
 - TPJ (BA 39)
 - Temporal lobe (BAs 21, 22, 38, 42)

Figure 4) Uncorrected *t*-values for SOME-any – SOME-all over the whole brain



Discussion

- Effects of context only observed in source space, not sensor space
- First evidence for non-violation-related modulation of neural activity by scalar inferences directly at the scalar term
 - Effect in unexpected direction: more activity in the condition that is associated with less inferencing (Breheny et al, 2006)
 - Activity may be related to **inhibiting inference** in context where it is not relevant (Nieuwland et al., 2010; Politzer-Ahles et al. 2013).
 - Alternatively, activity may be related to **realizing inference** in context where it is more difficult (less contextual support).

References

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