

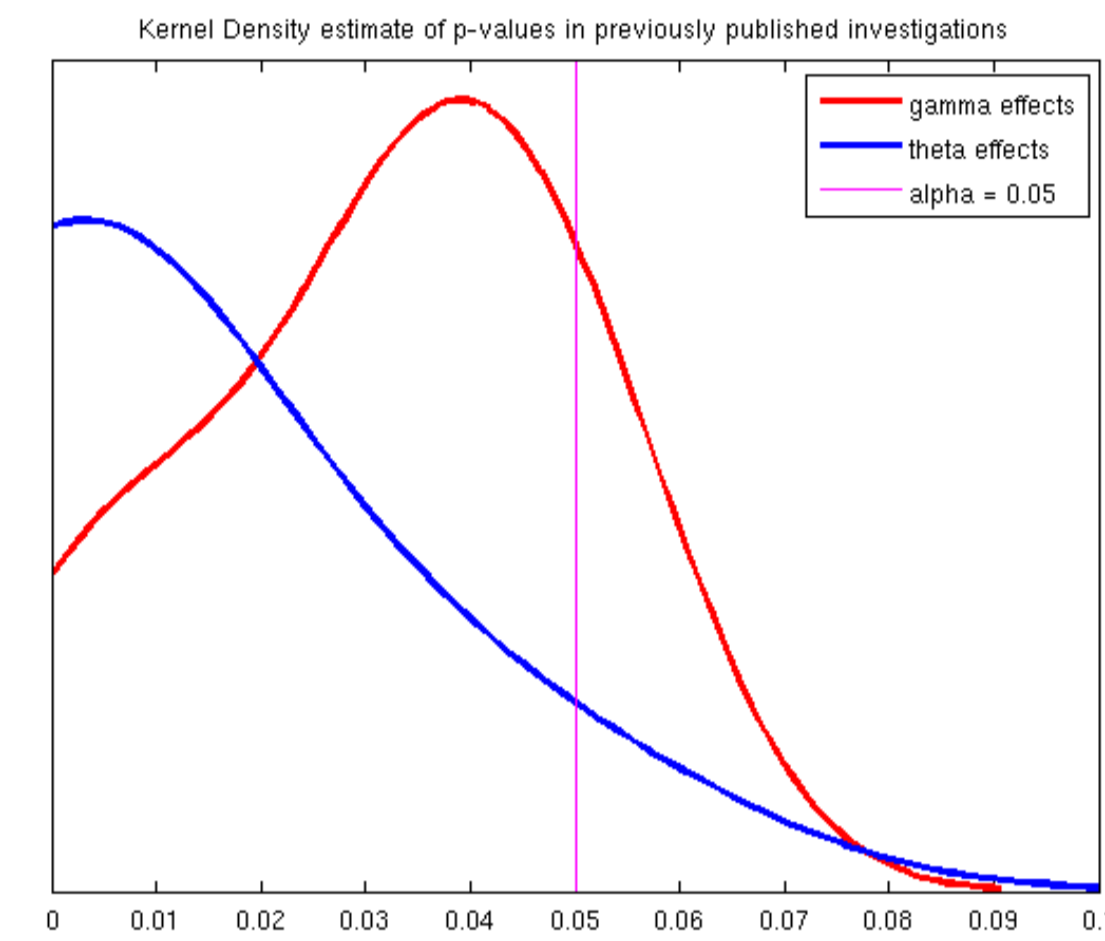
Motivation: Reproducibility of Results

Recently, research on event-related spectral perturbations (ERSPs) has begun to focus on the gamma band of the human EEG. Recent studies have reported gamma effects for semantic integration (related to cloze probability in classical N400 paradigms) [1–5], but the effects thus far have been far less consistent than previous findings in the lower frequency bands (cf. [6–10]). In line with recent concerns about the reliability of effects in the brain sciences [11–13], we performed meta-analysis of existing data. As the inconsistent previous findings do not allow for specific predictions, we used a pseudo-jackknife method.

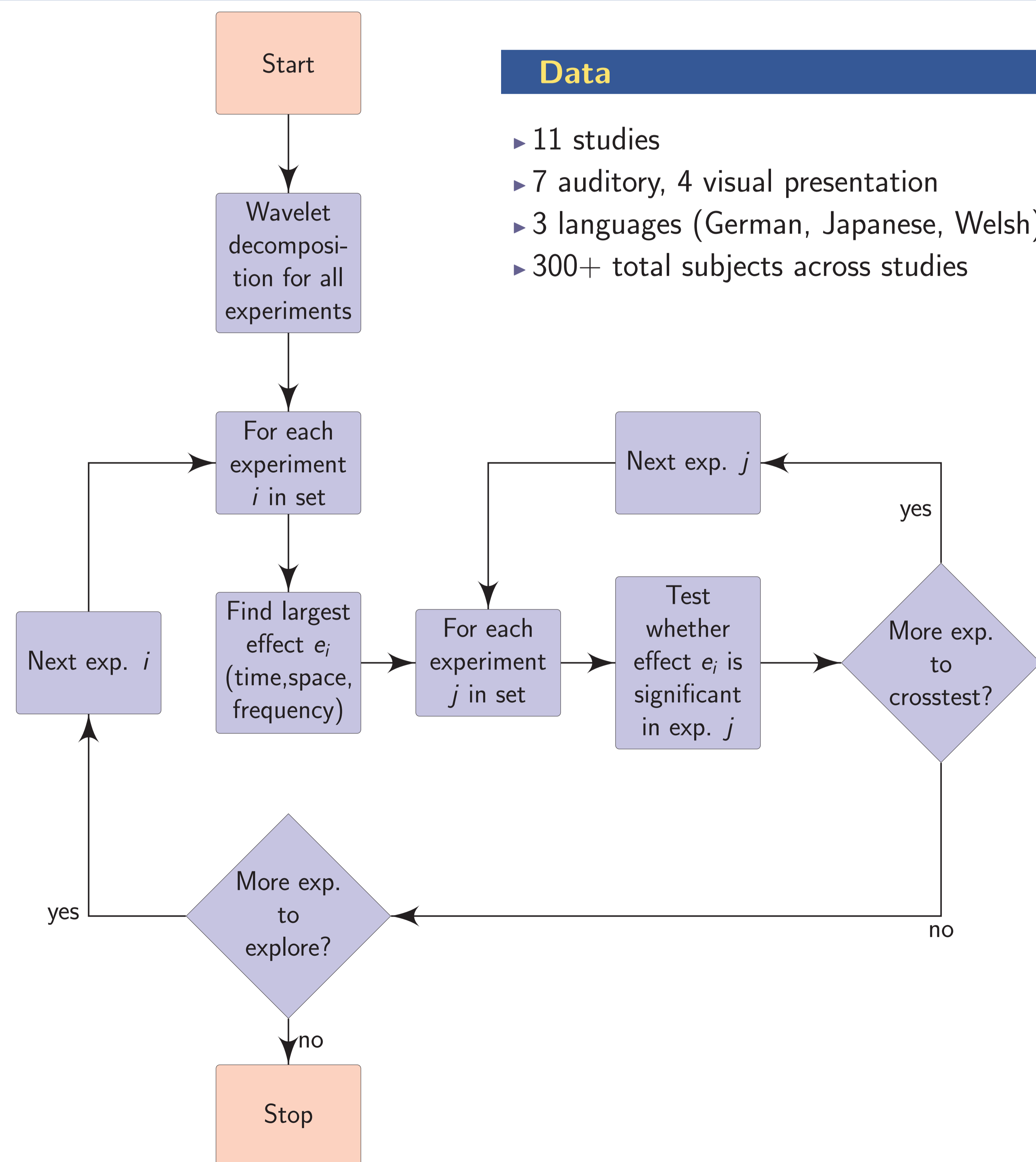
Literature

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p-Values in Prior Research



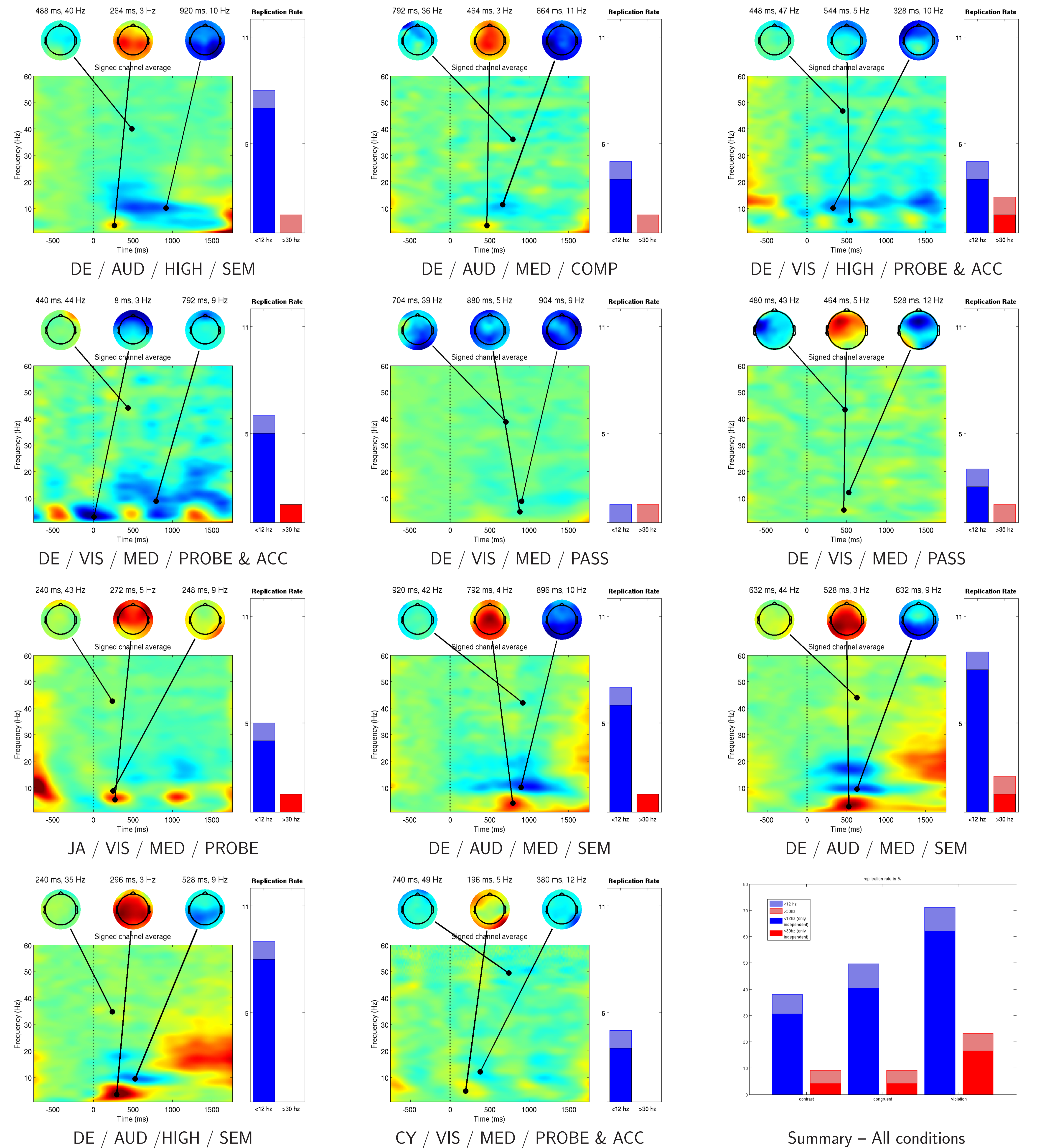
Method (Pseudo-Jackknife)



Data

- ▶ 11 studies
- ▶ 7 auditory, 4 visual presentation
- ▶ 3 languages (German, Japanese, Welsh)
- ▶ 300+ total subjects across studies

Replication



HIGH, MED, LOW = high, medium, low cloze probability;
 SEM = semantic judgment; COMP = comprehension task; PROBE = probe task;
 ACC = acceptability judgment task; PASS = passive listening
 DE = German; JA = Japanese; CY = Welsh

Time-frequency plots (average of all channels) with the topography of the strongest effect in the alpha, theta and gamma bands for the CONGRUENT condition. Adjacent bar plots indicate statistical significance of the low-frequency (alpha and theta together) and high-frequency effect across all experiments. Final bar plot (lower right) for total statistical replication for all three conditions (CONTRAST, CONGRUENT, VIOLATION).

Conclusion

Unlike low-frequency effects, **gamma effects** are not reliably elicited by the proposed experimental manipulation.