Evidentiality and Speaker Commitment: An fEMG Study

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Commitment-based view on communication

By performing certain speech acts we take on commitments: (e.g. Peirce, Brandom, Geurts, Krifka)

(1)   I'll do the dishes tonight.   [PROMISE]

(2)   Tom is a vegetarian.   [PLAIN ASSERTION]

- Commitments are normative and social: they are obligations to others to act in certain ways.
- Commitments constrain how we *should* behave given what we have said.
  - For assertions e.g. not continuing by making contradictory claims.

Other issues concerning commitment remain unclear, such as the effect of **reportative evidentials (REs)**:

(3)   I hear that Tom is a bachelor.   [RE]

- Does the use of REs reduce speaker commitment?
  - Do all RE structures lower commitment to a comparable degree (e.g., Koev 2021)?
  - Or is this modulated by syntactic form (e.g., Asher 2000, Murray 2014)?

fEMG to measure commitment

Facial electromyography measures activation of facial muscles.

- The *corrugator* "frowning muscle" activates in negative affective states
  - including indignation caused by social norm violations (Bartholow et al. 2001)

- Yates et al. 2025: One can also use fEMG to measure norm violations in conversation and from there infer the commitments taken on.
  - A speaker contradicting their prior (plain) assertions activates a perceiver's corrugator

Proof of Method: Yates et al. (2025)
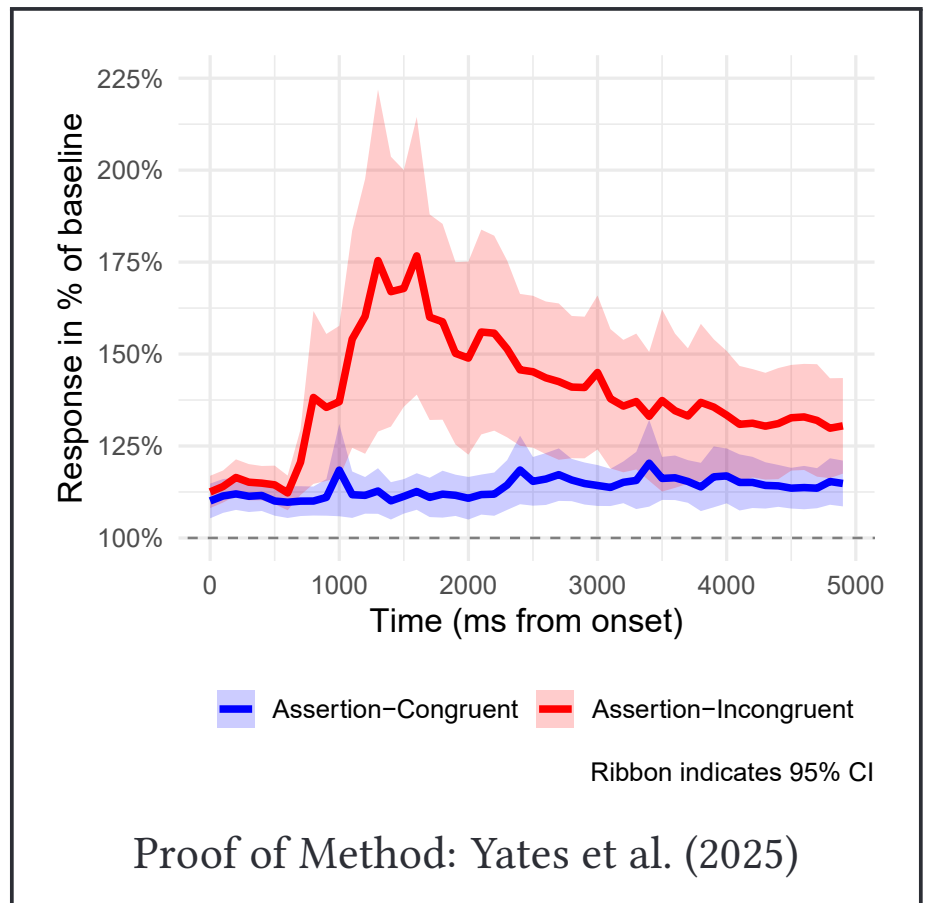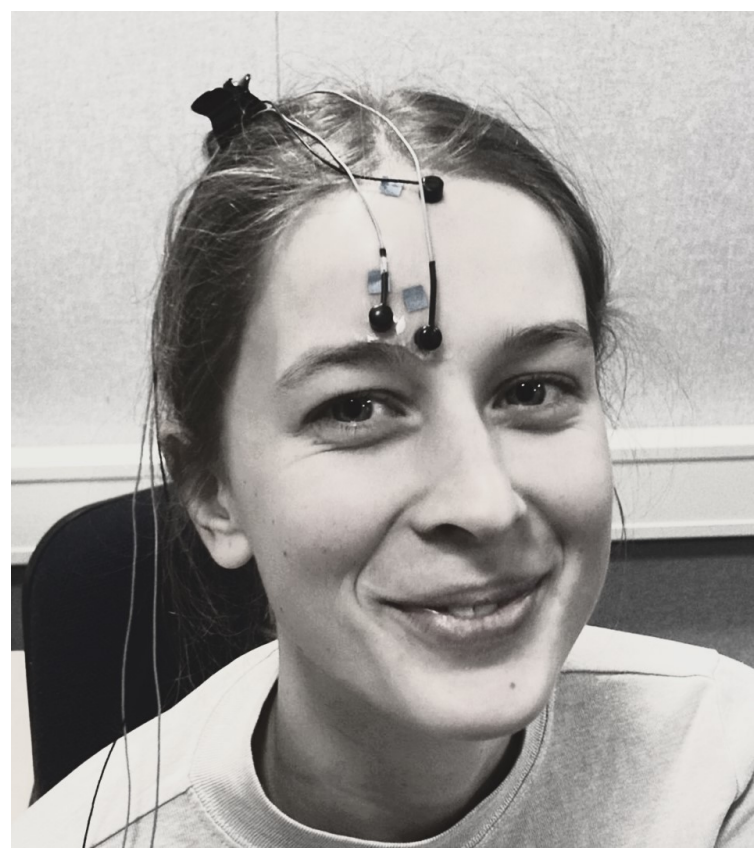
Research idea

We can use fEMG to learn more about the effect of REs:

- We compare the corrugator activity of participants who read scenarios in which a speaker is 'incongruent' to measure differences in perceived norm violation and hence in the commitments taken on in the different constructions.
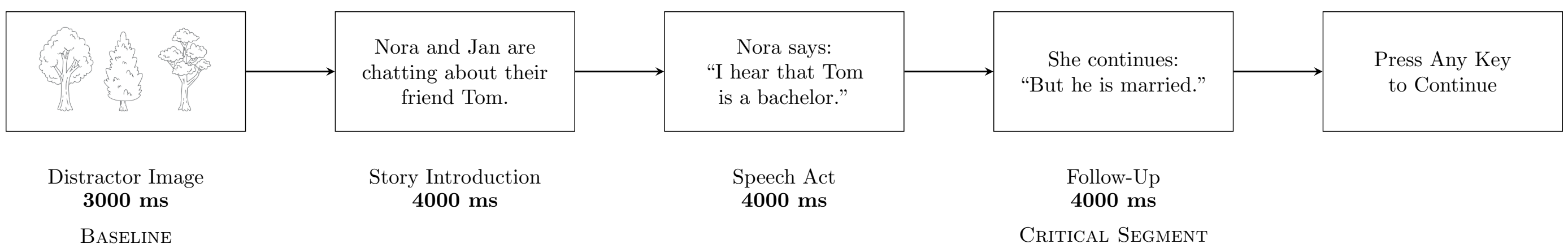
  HYPOTHESES:
  i. For incongruent continuations corrugator activity is higher for plain assertions than for RE assertions.
  ii. Corrugator activity is significantly lower for the congruent (control) condition.
  iii. If RE syntax modulates commitment (Asher 2000, Murray 2014), one might expect higher activity for incongruent parenthetical constructions than for embedding ones.
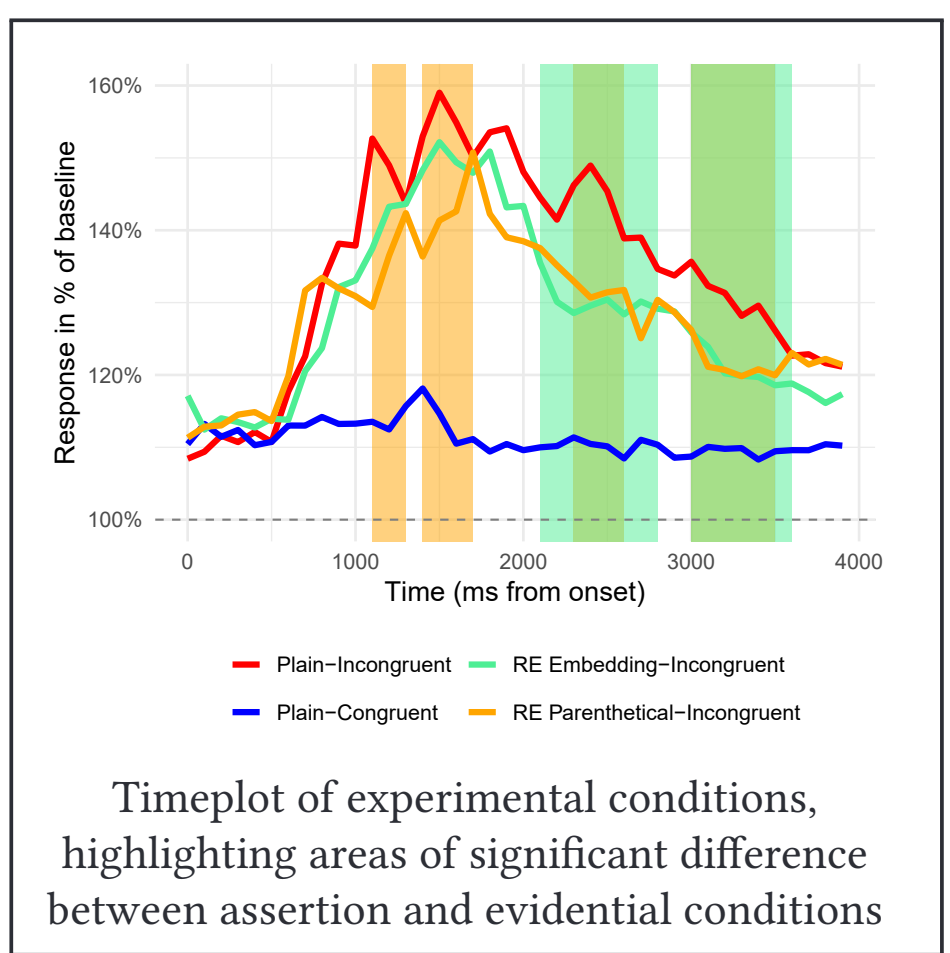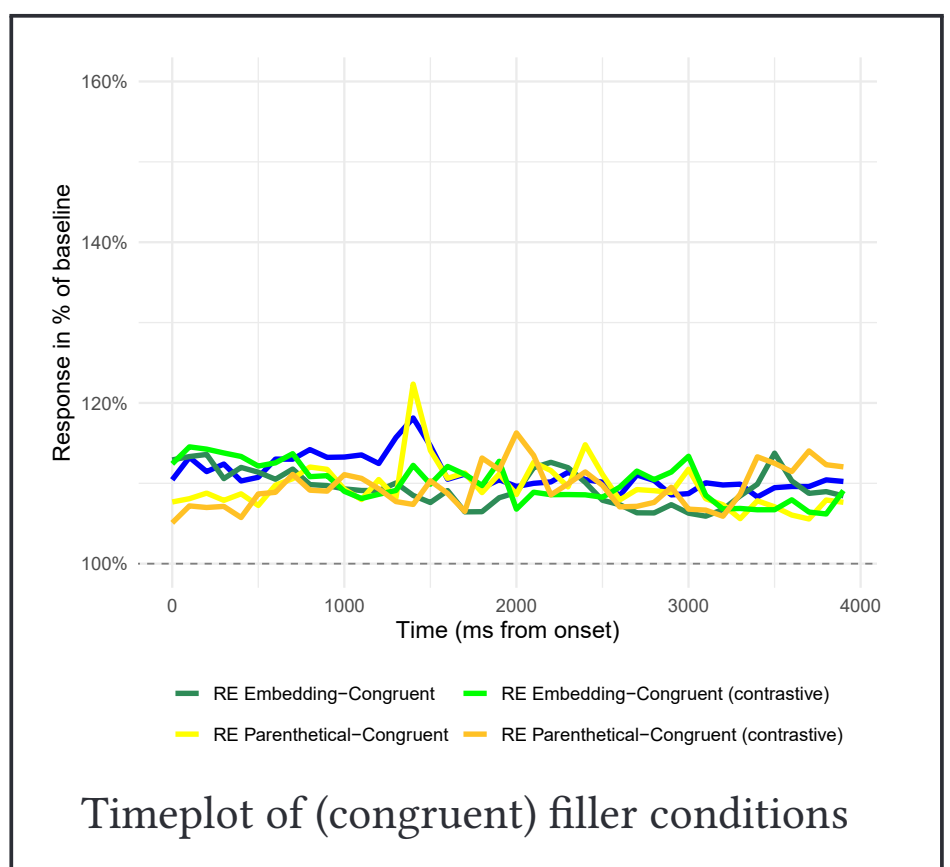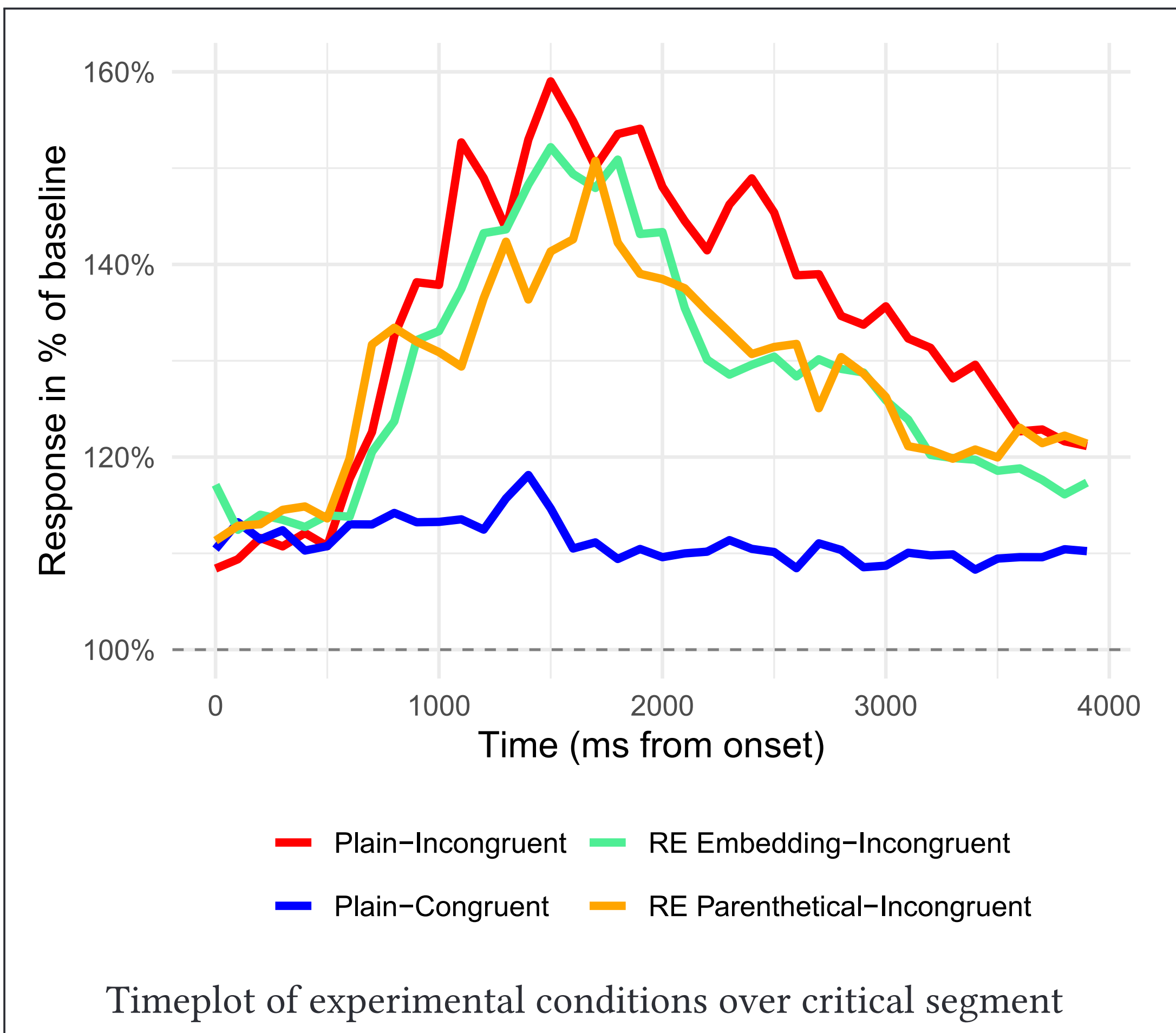
Design

Story Introduction:	Nora and Jan are chatting about their colleague Tom. Nora says:
Plain-Incongruent	"Tom is a bachelor. But he is married."
RE Embedding-Incongruent	"**I hear that** Tom is a bachelor. But he is married."
RE Parenthetical-Incongruent	"Tom is a bachelor, **I hear**. But he is married."
Plain-Congruent	"Tom is a bachelor. He is single."

Example RE Embedding-Incongruent condition (one item):

Distractor Image **3000 ms** BASELINE	Nora and Jan are chatting about their friend Tom. Story Introduction **4000 ms**	Nora says: "I hear that Tom is a bachelor." Speech Act **4000 ms**	She continues: "But he is married." Follow-Up **4000 ms** CRITICAL SEGMENT	Press Any Key to Continue

- 96 vignettes, 16 per condition (64 experimental items, 32 filler items)
- Stimuli presented in Dutch, to native Dutch speakers
- 9 participants excluded (8 due to technical issues, 1 outlier)
- 57 participants (43 female, 12 male, 2 other; age range = 18–71 years; $M = 26$)

Results

Timeplot of experimental conditions over critical segment

Legend: Plain–Incongruent, RE Embedding–Incongruent, Plain–Congruent, RE Parenthetical–Incongruent

Timeplot of (congruent) filler conditions

Timeplot of experimental conditions, highlighting areas of significant difference between assertion and evidential conditions

i. Greater corrugator activity for assertions than for RE conditions ($\hat{\beta} = 6.10$, $p = .036$).

ii. Greater corrugator activity for plain assertions and RE conditions than for (congruent) controls ($p < .001$).

iii. No significant difference within RE conditions ($\hat{\beta} = 0.22$, $p = .95$).

⇒ **Evidence towards reportative evidentials lowering perceived speaker commitment, but no evidence that this differs by syntactic structure.**

From proof of method to theoretical insights

fEMG can be used to indirectly measure straightforward speaker commitments (Yates et al. 2025)	→	**This is true also for the more subtle questions of commitment for REs**	→	Apply to open theoretical issues: • hearer commitment (is some action on the side of the addressee required before something becomes a shared commitment? (e.g. Clark 1996)) • commitment de lingua (Harris 2016, Hess et al. 2023)

PROJECT WEBSITE & MATERIALS: