fEMG as a window into conversational commitments

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A commitment-based view on speech acts

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. [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 a contradictory claim ('He eats a lot of meat')

But what about the addressee? And evidentials?

⇒ Find a way to gather reliable data on the assignment of commitments in discourse.

fEMG as a measure of moral indignation

- Bartholow et al. (2001) found a clear correlation between reading of a social norm violation (e.g. someone refusing to shake hands) and activation of the corrugator or frowning muscle.

⇒ The corrugator muscle becomes active in the case of moral indignation.

Research idea

We can use fEMG to measure norm violations in communication, and from there derive the commitments taken on.

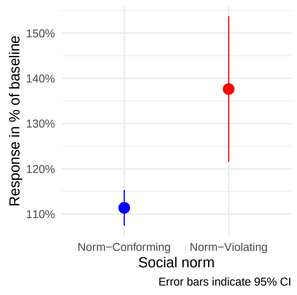
- HYPOTHESIS PROOF OF METHOD:

  Corrugator activity increases when assertions are followed by incongruent assertions, compared to congruent assertions

Social norms

- included to see if we would (conceptually) replicate Bartholow et al.'s results
- items based on Bartholow et al. and Hubers et al. (2016)

Introduction:	Jonathan and Natasha are meeting their new female manager.
norm-conform	Jonathan shakes the woman's hand.
norm-violating	Jonathan refuses to shake the woman's hand.

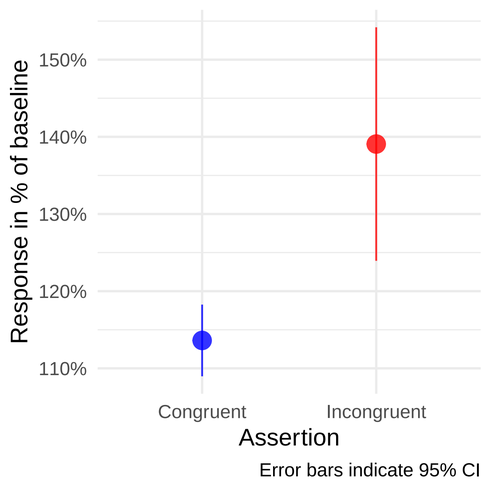


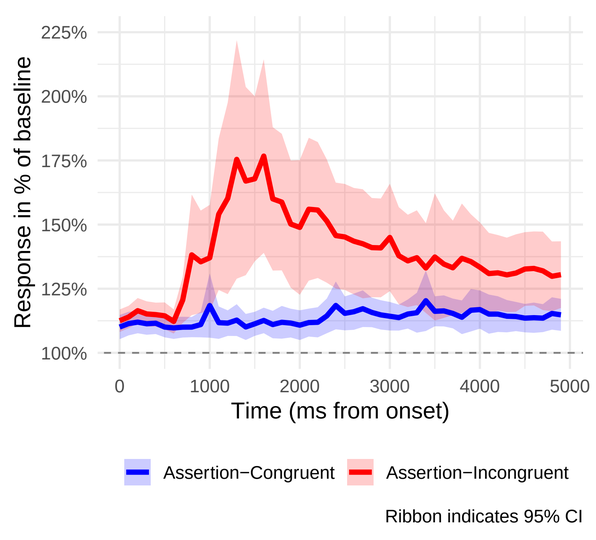
- confirmation of the results from Bartholow et al.:

⇒ As expected, increased corrugator activity for social norm violated compared to the norm-conforming condition (M_{diff} = 26.3 [18.22; 34.31]).

Assertions

Introduction:	Joyce and Niels discuss the eating habits of their friend Tom. Joyce says:
congruent	'Tom is a vegetarian. He eats a lot of tofu.'
incongruent	'Tom is a vegetarian. He eats a lot of meat.'



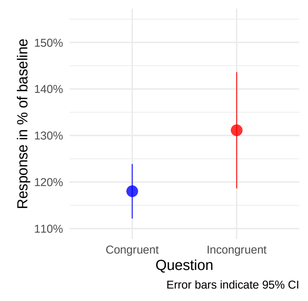


⇒ As expected, higher corrugator activity for incongruent follow-up than for congruent ones (M_{diff} = 25.5 [17.68; 33.22]).

Questions

- included to check that it is the speech act performed, and not just the individual words or sentence content, which led to corrugator activity

'congruent'	'Is Tom a vegetarian? He eats a lot of tofu.'
'incongruent'	'Is Tom a vegetarian? He eats a lot of meat.'



⇒ Greater corrugator activity for 'incongruent' follow-up, but this effect was (significantly) smaller than for assertions (M_{diff} = 12.8 [5.74; 20.03]).

DESIGN

Dutch, 62 participants
96 vignettes
16 items per condition
32 social, 64 speech act
items pretested

attention checks
neutral image presented per-trial for baseline
recorded using BIOPAC, preprocessing in MATLAB
calculated follow-up amplitude as % of baseline MAV
data exported from MATLAB to R for analysis

ANALYSIS

The maximal model allowed by the data included speech act type, congruency, and their interaction as fixed effects, and random intercepts for participants and items. Likelihood ratio tests indicated a significant main effect of congruency ($\chi^2(1) = 50.57$, $p < .001$) and a significant interaction ($\chi^2(1) = 5.29$, $p = .021$). Main effect of speech act type not significant ($\chi^2(1) = 0.43$, $p = .514$).

From proof of method to theoretical insights

the case of assertion and speaker commitment → **fEMG can be used to measure norm violations and indirectly commitments taken on** → 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)
- reportative evidentials and commitment (e.g. AnderBois 2014, Faller 2019)
- commitment de lingua (Harris 2016, Hess et al. 2023)