Glimlachen en fronsen tijdens spraakverstaan

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Effects of smiling

(Ohala 1980, 1983; Drahota e.a., 2008; Tartter, & Braun, 1994)

- Shortens vocal tract
- Higher formant frequencies
- Audible

For frowning: opposite pattern

Research question

How and when do listeners integrate perceived smiles/frowns with linguistic meaning?

Quené et al. (2012)

Stimuli: positive and negative words

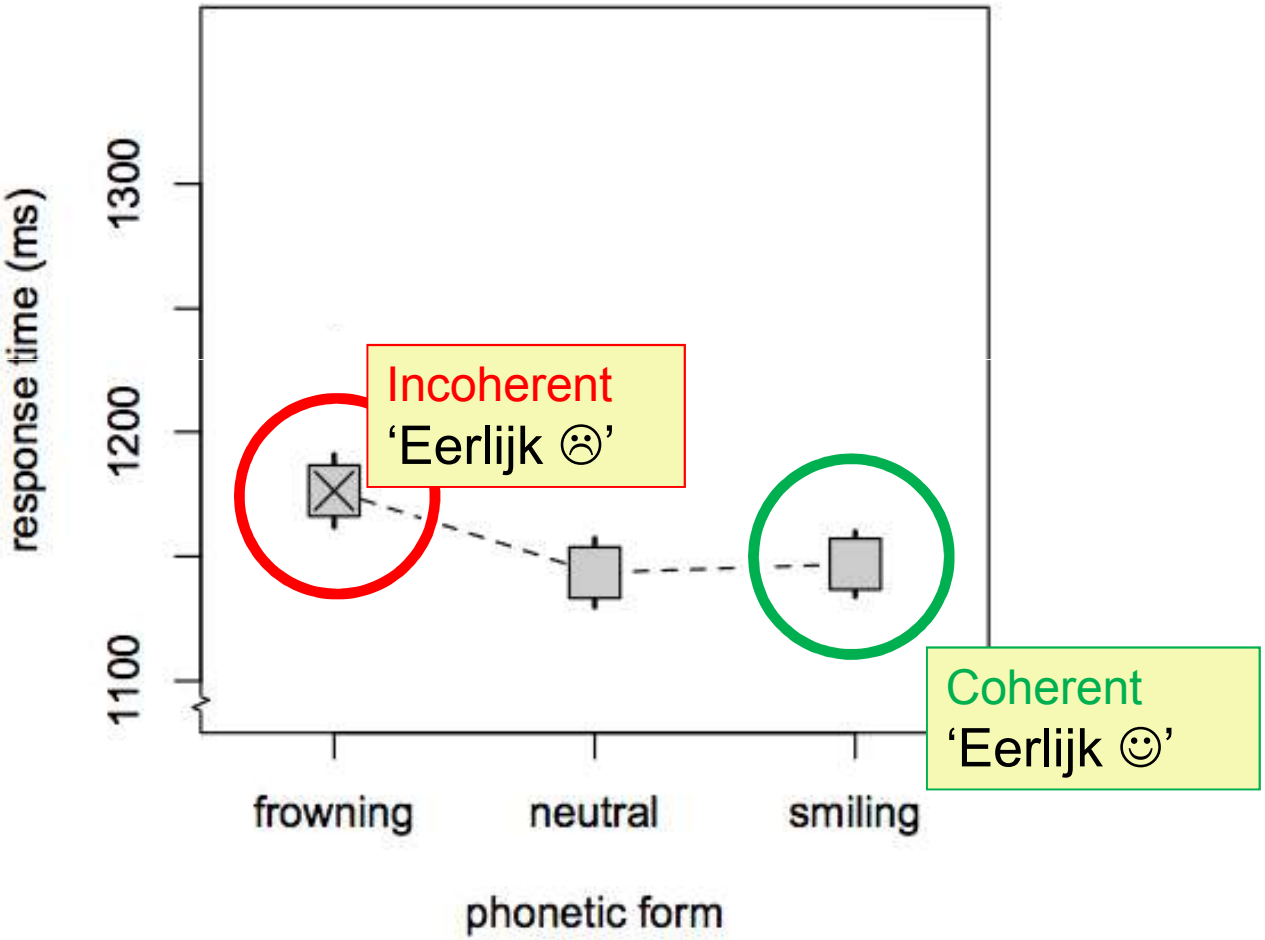
- with a smile or frown
  - shifting up/down formants by 10%

Task: semantic classification

Coherent
☺ Eerlijk

Incoherent
☹ Eerlijk

Quené et al. (2012)



Quené et al. (2012)

- Listeners responded slower to positive frowned words than to positive smiled words

- Mismatch between perceived smile/frown and word meaning delays comprehension
- Listeners attend to shifting formant values

Research question:

How and **when** do listeners integrate perceived smiles/frowns with **sentence** meaning?

Stimuli

- Coherent
- Incoherent
- 1st person

‘Ik heb een prijs gekregen’
☺=coherent
☹=incoherent

- Smile or frown manipulation using Praat’s LPC analysis and resynthesis
- Formant shift: 10%
- Manipulation on whole utterance

Stimuli

- Coherent
- Incoherent
- 1st person

‘Ik heb een boete gekregen’
☹=coherent
☺=incoherent

- Smile or frown manipulation using Praat’s LPC analysis and resynthesis
- Formant shift: 10%
- Manipulation on whole utterance

Procedure

- Participants (n=36) listened to sentences while their EEG was recorded
- They press a button to continue to next trial
- NO additional tasks

‘Ik heb een prijs gekregen’

Marker at onset critical word

Predictions

A priori assumption listener (based on episodic memory):

When hearing a speaker smile AND talk about oneself, speaker is going to say something positive

Predictions

- Listener rapidly detects mismatch between smile/frown and sentence meaning
  - Larger processing costs for incoherent items
  - Difference between ERPs for coherent and incoherent items

To make things more interesting…

…we also added *perspective*

Because talking about someone else is different than talking about yourself

…especially in the case of affect

‘Ik heb een prijs gekregen’ ☺ coherent

‘Hij heeft een prijs gekregen’ ☺ coherent/incoherent?

Stimuli

- Coherent
- Incoherent
- 1st person

‘Ik heb een prijs gekregen’
☺=coherent
☹=incoherent

- Smile or frown manipulation using Praat’s LPC analysis and resynthesis
- Formant shift: 10%
- Manipulation on whole utterance

Stimuli

- Coherent
- Incoherent
- 1st person

  AND 3rd person

‘Ik heb een prijs gekregen’
☺=coherent
☹=incoherent

‘Hij/ze heeft een prijs gekregen’
☺=coherent
☹=incoherent

Stimuli

Items:

- Coherent / incoherent
- 1st / 3rd person perspective (ik, hij, ze)
- Pretested for semantic valence and intelligibility (after manipulation)

Predictions 1P

A priori assumption listener (based on episodic memory):
When hearing a speaker smile AND talk about oneself, speaker is going to say something positive

Predictions 3P

A priori assumption listener less clear

When hearing a speaker smile AND talk about someone else, it depends on speakers relation to that person whether he going to say something positive about him/her

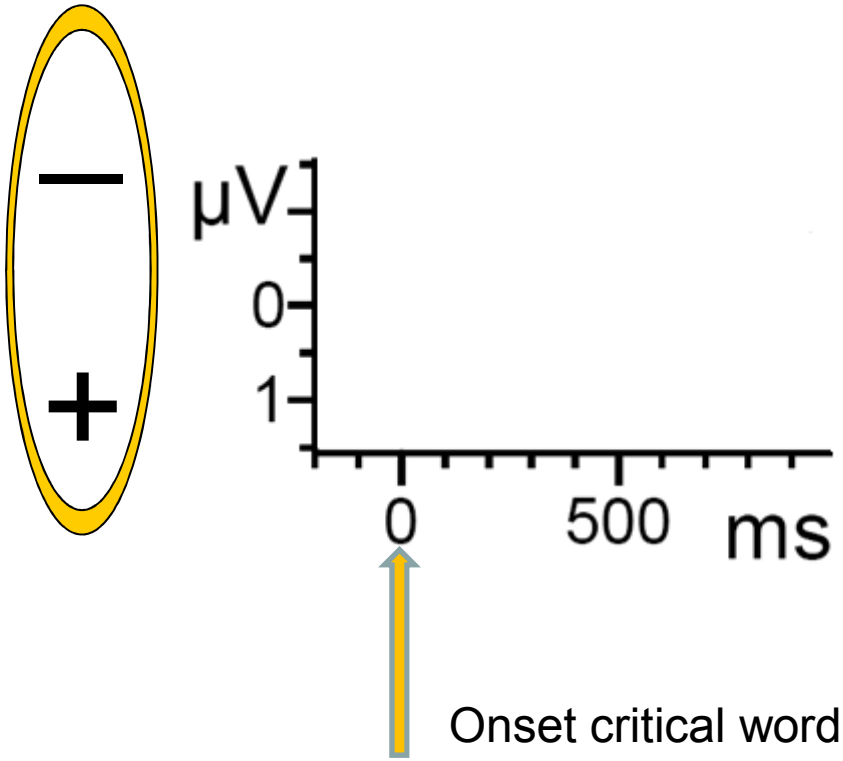
☹Hij heeft een **prijs** gekregen

☺Hij heeft een **prijs** gekregen

Predictions 3P

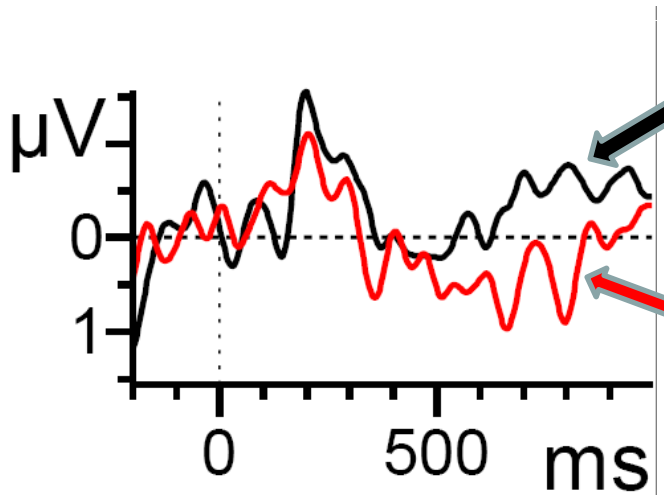
- Again, expected difference between coherent and incoherent items
- But difference coherent-incoherent smaller than for the 1st person perspective items
- Because a priori assumptions listener less clear:
  - smile-positive items perceived as coherent (e.g. son) or as incoherent (e.g. opponent)

Results: ERPs



Results: 1P

- Listeners rapidly detect mismatch
- ERPs start diverging around 500ms
- Positive deflection



Coherent
☺ Ik heb een prijs gekregen

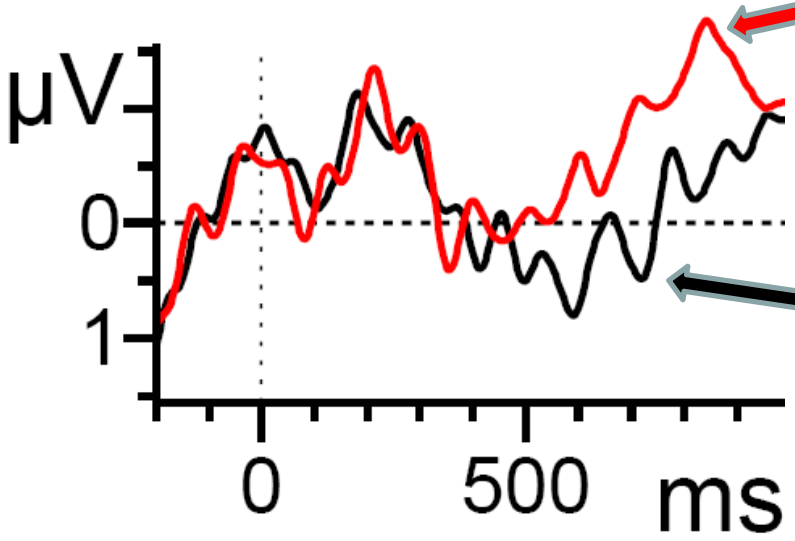
Incoherent
☹ Ik heb een prijs gekregen

Results: 1P

- Rapid detection of mismatch between expression (smile/frown) and sentence meaning
- Positive deflection associated with integration difficulties (Brouwer et al., 2012)

Results: 3P

- Again rapid detection mismatch
- Again, ERPs start diverging around 500ms
- But *negative* deflection!?

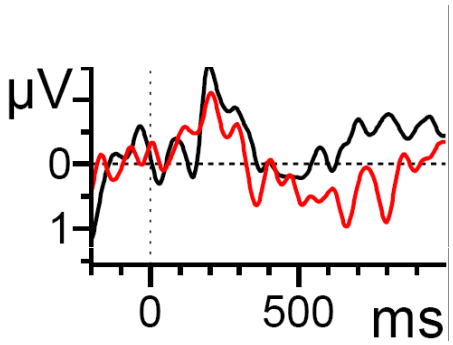


Incoherent
☹ Hij heeft een prijs gekregen

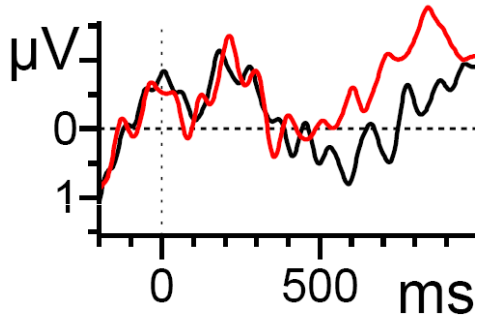
Coherent
☺ Hij heeft een prijs gekregen

1P and 3P perspective

1st person



3rd person



•Both ERPs start to diverge around 500 ms
•For 1st person perspective: *positive* deflection
• For 3rd person perspective: *negative* deflection
•Peak latency and amplitude similar

- Qualitatively different process?
- Or in fact same underlying mechanism?
- **3rd person incoherent is in fact perceived as coherent??**

Tentative interpretation

- Consider possibility that 3rd person coherent is perceived as incoherent?

Tentative interpretation

A priori assumption *female* listener:
- when hearing a *male* speaker frown AND talk about someone else, speaker is going to say something *positive* about that person

So perspective matters:

In the case of male speaker:

- *Smiling* AND talking about *positive* things at the same time is perceived (by females) as:
  - **Coherent** when talking about *oneself*
  - **Incoherent** when talking about *someone else*

→ the (female?) interpretation of a smile during spoken sentence comprehension depends on the perspective of the (male?) speaker

Research question

How and **when** do listeners integrate perceived smiles/frowns with **sentence** meaning?

Conclusions: how question

Listeners seem to have a priori assumptions about the meaning of a smile/frown during sentence comprehension

- Assumptions depend on perspective speaker
- Violations of these assumptions result in integration difficulties, reflected in ERPs

Conclusion When-Question

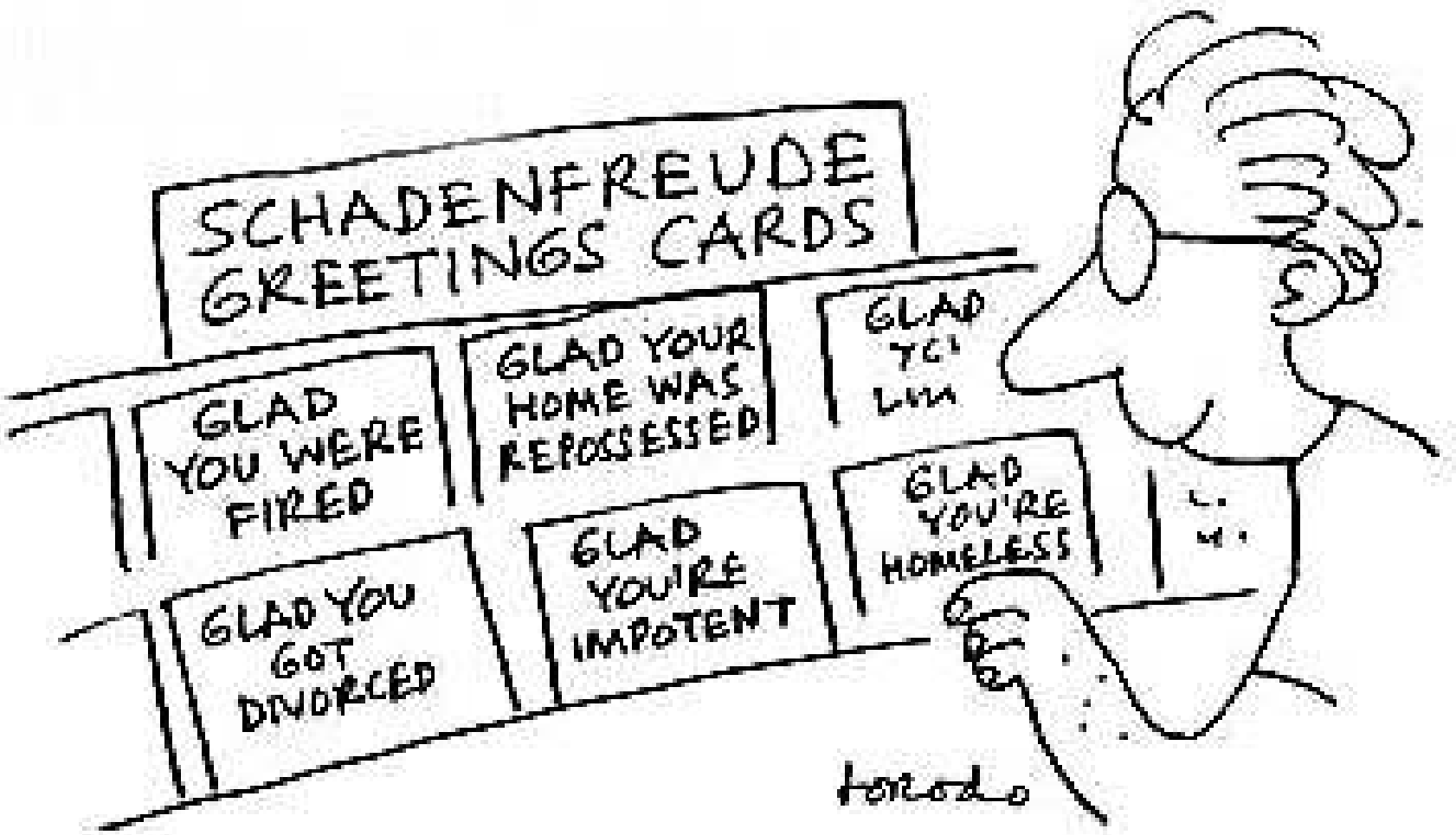
- Listeners *very rapidly* integrate the perceived smile/frown and unfolding sentence meaning
  - Around 500ms after word onset listers discriminate between coherent and incoheren items

General conclusion

Listeners very rapidly integrate perceived smile/frown with unfolding sentence meaning (shown by mismatch effect)

No 1:1 mapping expression→meaning

- Audible smiles/frowns generate semantic expectations that depend on perspective


SCHADENFREUDE GREETINGS CARDS
GLAD YOU WERE FIRED
GLAD YOUR HOME WAS REPOSSESSED
GLAD YC LIVI
GLAD YOU GOT DIVORCED
GLAD YOU'RE IMPOTENT
GLAD YOU'RE HOMELESS
toredo