

Hesitations affect language comprehension, but the type of hesitation matters



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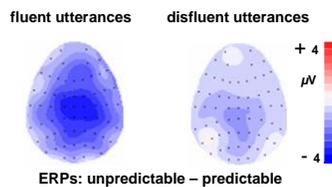
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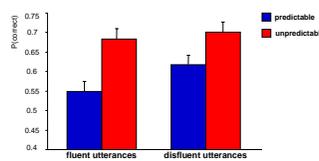
Background

When speakers hesitate because of speech production difficulties, they might pause, produce a filler such as *er*, or repeat some information. We have previously shown that *er* hesitations affect language comprehension, using ERPs and recognition memory^[1]:

- following an *er*, ERPs showed an attenuation of the N400 effect, demonstrating a reduction in the standard difference where unpredictable words are more difficult to integrate into their contexts.



- words following an *er* were more likely to be correctly recognised in a subsequent memory test, demonstrating longer-term consequences for language representation.



What are the effects of disfluent repetitions on language comprehension?

Methods

Stimuli

- 160 high constraint utterances ending in target words which were either **predictable** (mean cloze probability 84%) or **unpredictable** (0%).
- half the utterances were fluent and half were disfluent.
- disfluent utterances included a **repetition** before the critical word.

She hated the jumper but then she's never liked my taste in clothes/music
She hated the CD but then she's never liked my taste in in music/clothes

Procedure: listening for comprehension

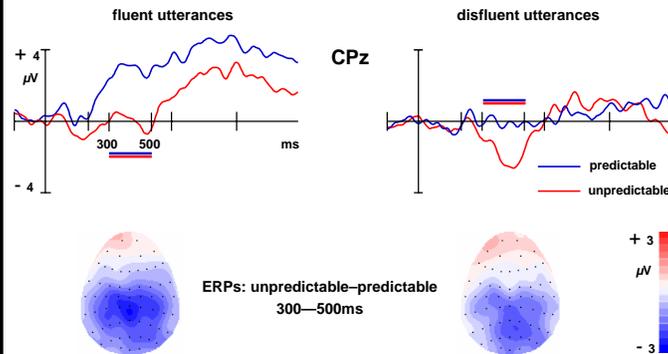
- participants (n=16) listened to the utterances interspersed with filler utterances which contained different disfluencies at various points.
- EEGs were recorded from 61 silver/silver chloride electrodes re-referenced off-line to the average of left and right mastoid recordings.

Procedure: recognition memory test

- 160 utterance-final OLD words were presented visually interspersed with frequency matched NEW distracters.
- participants rated each word as OLD or NEW using a button box.

ERPs for words following a repetition

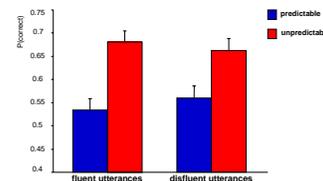
- ERPs were formed relative to **predictable** and **unpredictable** words, for fluent and disfluent utterances.



Analyses: 300–500ms

- analyses compared the ERPs between **unpredictable** and **predictable** words for fluent and disfluent utterances.
- unpredictable words elicited a relative negativity over central/centro-parietal scalp regions, which we interpret as an N400.
- disfluent repetitions preceding the target words did not affect the amplitude of the ERP difference in the standard N400 time window.

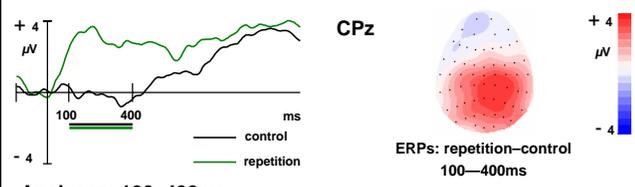
Recognition memory for words following repetitions



- unpredictable words were more likely to be correctly recognised than predictable words.
- disfluent repetitions preceding the target words did not affect recognition memory.

ERPs for repetitions

- ERPs were formed relative to **repetitions** and fluent control words.



Analyses: 100–400ms

- analyses compared the ERPs between **repetitions** and acoustically identical fluent control words.
- repetitions elicited a relative positivity over posterior scalp regions with a right hemisphere bias which we interpret as a P600.
- the positivity onset earlier than the typical P600, but the positivities in earlier (50–150ms) and later (100–400ms) time windows were not topographically distinct.

Conclusions

1. Disfluent repetitions do not affect semantic integration of subsequent words

- the standard N400 effect reflecting semantic integration cost was unaffected by the presence of a preceding repetition.
- this differs from the effect following an *er* observed previously.

2. Disfluent repetitions do not have longer-term consequences for language representation

- recognition memory for words was unaffected by the presence of a preceding repetition.
- this differs from the effect following an *er* observed previously.

3. Processing of disfluent repetitions engages syntactic reanalysis

- disfluent repetitions elicited a positivity relative to fluent controls which we interpret as a P600.

Outstanding question

- what is the effect of processing *ers* themselves and does this differ from the positivity associated with processing repetitions?

[1] Corley et al. (2007) *Cognition*.