

An ERP Investigation of the Effects of Emoji Valence on Text Processing



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Introduction

Does a reader take emojis into account when interpreting a text message?

Emojis:

- Provide extralinguistic information, e.g. sender's mental/ emotional state
- Maintain conversational connection [1]

Comprehenders:

- Rapidly integrate social information [2]

ERPs:

- N100: automatic, attention [3]
- P3b/LPP: cognitive workload [3]
- N400: sensitive to meaning [4]

Hypothesis:

Emotional valence of emojis differentially impacts emoji-text integration

Predictions:

Different ERP effects of happy and sad emojis on the very same text

- A. Sad emojis more relevant for meaning, show enhanced N400 at first word
- B. Happy emojis less relevant for meaning

Methods

37 students, 16 m, age $M=19.28$, $SD=1.19$

Task: describe sender's mood

ERPs recorded from 64 channels

102 emotionally ambiguous text messages (2-6 words, valence $M=3.07$, $SD=0.74$ on 6-point scale)

3 conditions: Happy emoji, Sad emoji, Comma (no emoji)

Hey



Emoji Valence:

Happy ($M=4.81$, $SD=0.46$)

Sad ($M=1.40$, $SD=0.63$)

Results

First word (*please*): 1

- Larger N400 for emojis compared to no emoji
- Larger frontal N400 450-550ms ($p=.066$) for sad compared to happy emojis

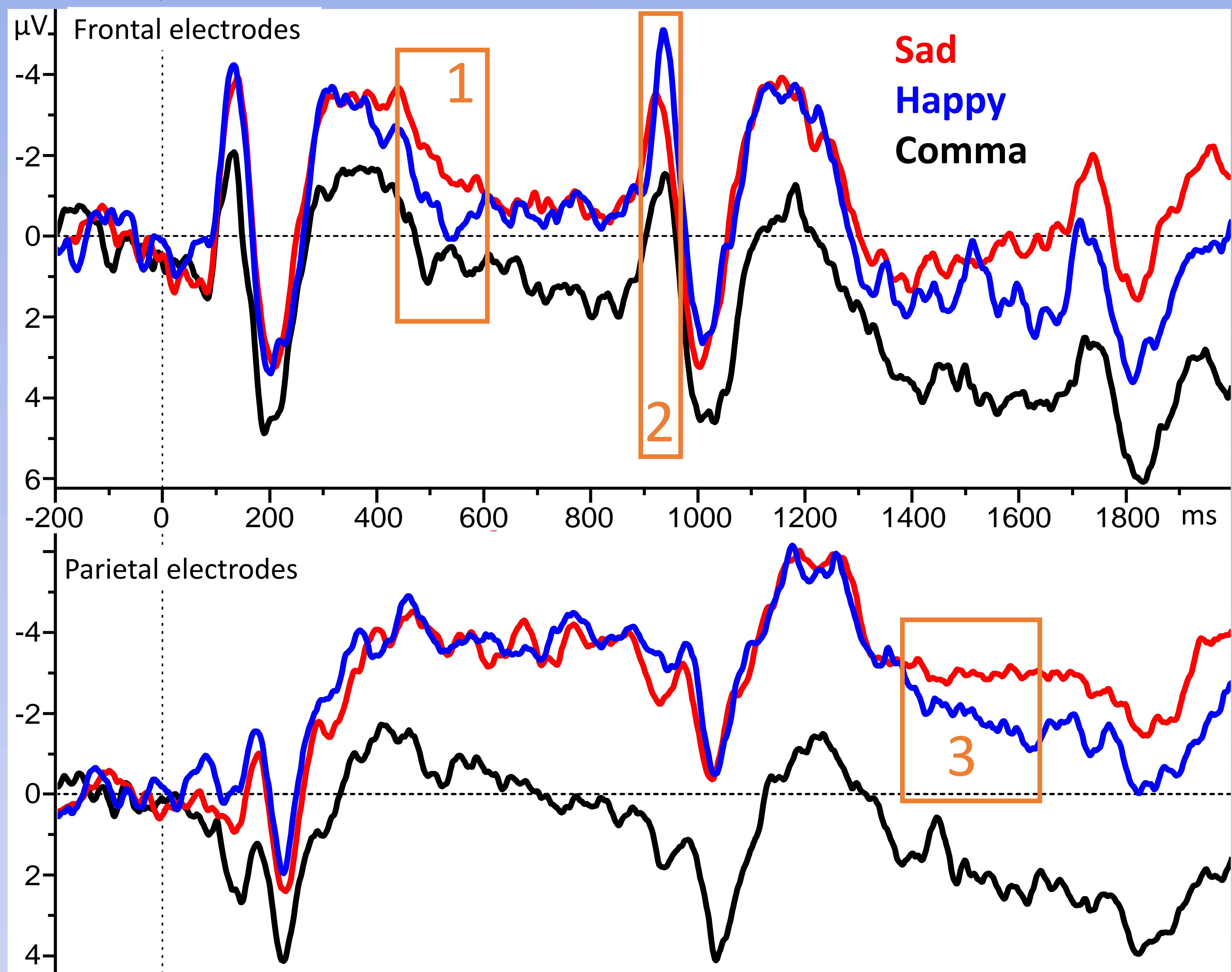
Second word (*call*): 2, 3

- Reduced N100 (100-150ms) (frontal, $p=.033$)
- Reduced LPP (600-850ms) (parietal, $p=.04$) for sad compared to happy emojis

please

call

me



Discussion

- 1 *Sad emojis*: encourage more integration effort, frontality suggests imagery processing [5]
- 2,3 *Sad emojis*: increased cognitive workload leads to reduced subsequent components
Happy emojis: processing capacities remain unaffected

Conclusion

Emoji valence determines relevance for text interpretation

Sad emojis induce more thorough processing at first word, reduce resources for processing later words
Happy emojis do not affect text processing as sad ones, act to maintain a conversational connection

References: [1] Kelley & Watts, 2015 [2] van den Brink et al., 2010 [3] Ghani et al., 2020 [4] Kutas & Federmeier, 2011 [5] Schendan & Ganis, 2012