

Brain potentials of expressive content: New evidence for semantic theory

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Background

Literature

- Def: Speaker-oriented, not-at-issue (NAI) entailments
 - e.g. swearing, honorifics, formal/familiar distinction
- Independent Speech Acts (Frazier, Dillon, & Clifton, 2015, 2017)
 - Expressives processed as separate speech act → Fast
 - Speech Acts are processed automatically (Holtgraves & Ashley, 2001) and rapidly at ~200 ms (Gisladdottir et al., 2015)
 - Left angular gyrus and temporo-parietal areas (Egorova et al., 2016)
- Unidimensional direct update to Common Ground (Schlenker, 2010)
 - NAI content (expressives) is processed before the at-issue content
 - All things being equal, NAI content is processed early
- Semantic frameworks of continuations (Barker, Bernardi, & Shan, 2010)
 - Once NAI content (expressives) has been launched, its composition is 'ballistic', not affected by surrounding material
 - Expressives do not depend on the discourse context
- Multidimensional (Potts, 2007)
 - Expressives have 6 properties including *immediacy* and *independence*
 - The damn dog is on the couch
 - descriptive*: the dog is on the couch
 - expressive*: the dog is held in low regard

Research Question: With respect to these competing theoretical accounts, how and when are expressives processed?

- Most theories predict rapid processing for NAI content

Hypothesis

- Despite being secondary, NAI content, expressives are processed relatively quickly

Methods

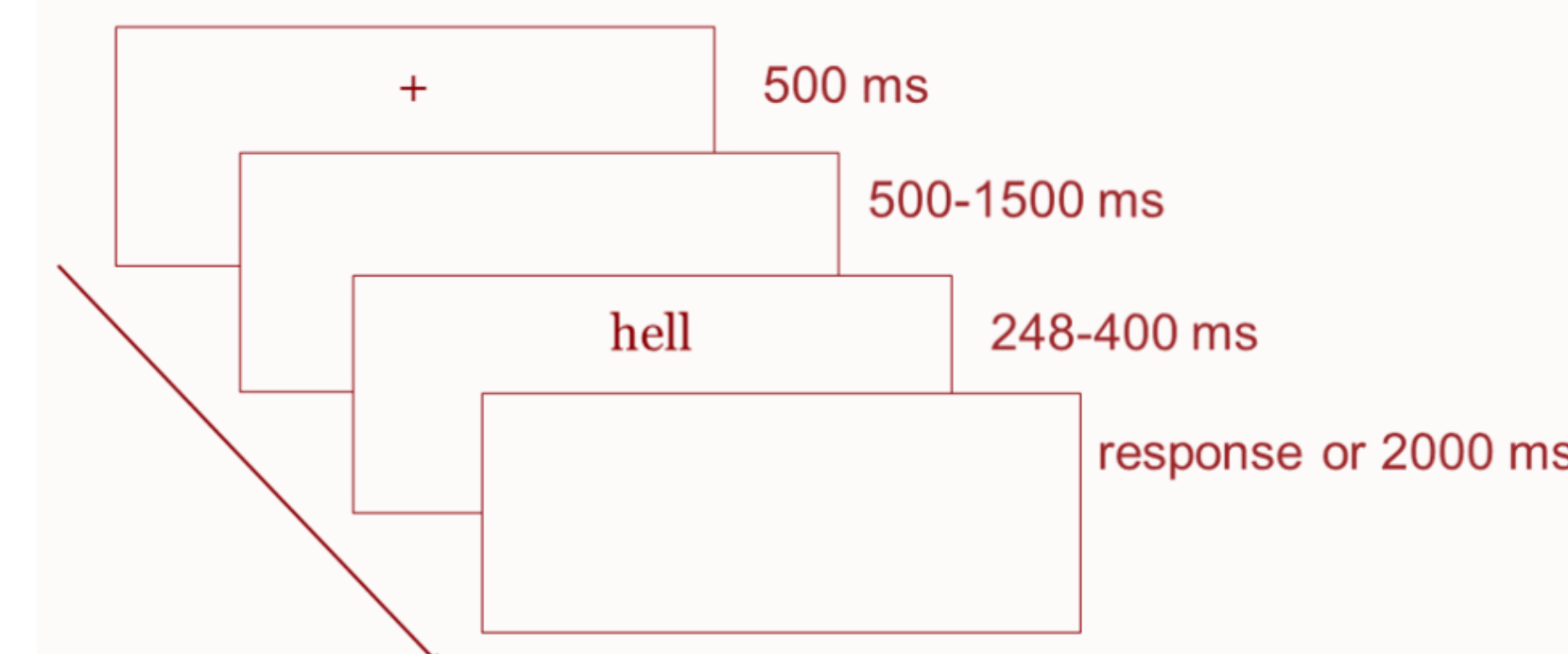
- Participants.** 18 native English-speaking students, right handed, 9 females, ages 18-34
- Materials.** 28 swear words, 28 emotional words with negative valence, 28 neutral words, 28 closed class words, 112 pseudowords.

Word properties

	Letter Length	Subtlex Freq.	Log Subtlex	Ortho N	Num Phonemes	Valence
Swear Words (<i>shit</i>)	4.96	119.93	3.39	8.24	3.84	3.38
Negative Valence Words (<i>kill</i>)	4.89	119.47	3.59	6.18	4.14	2.45
Open Class Neutral Words (<i>wood</i>)	5.00	116.69	3.25	6.39	4.04	6.15
Closed Class Words (<i>while</i>)	4.97	113.45	3.36	6.37	3.83	X
p value for t-tests comparing Swear with all others	.95	.56 (.99 swear/n eg only)	.55	.91	.51	NA

Procedure

- Lexical decision task.**



Sequence of one trial of the lexical decision task.

- EEG.** Continuous EEG recorded from 64 Ag-Ag/Cl channels
 - Data referenced online to vertex electrode (Cz); re-referenced offline to algebraic average of L and R mastoids, analyzed with Brain Vision Analyzer 2.0

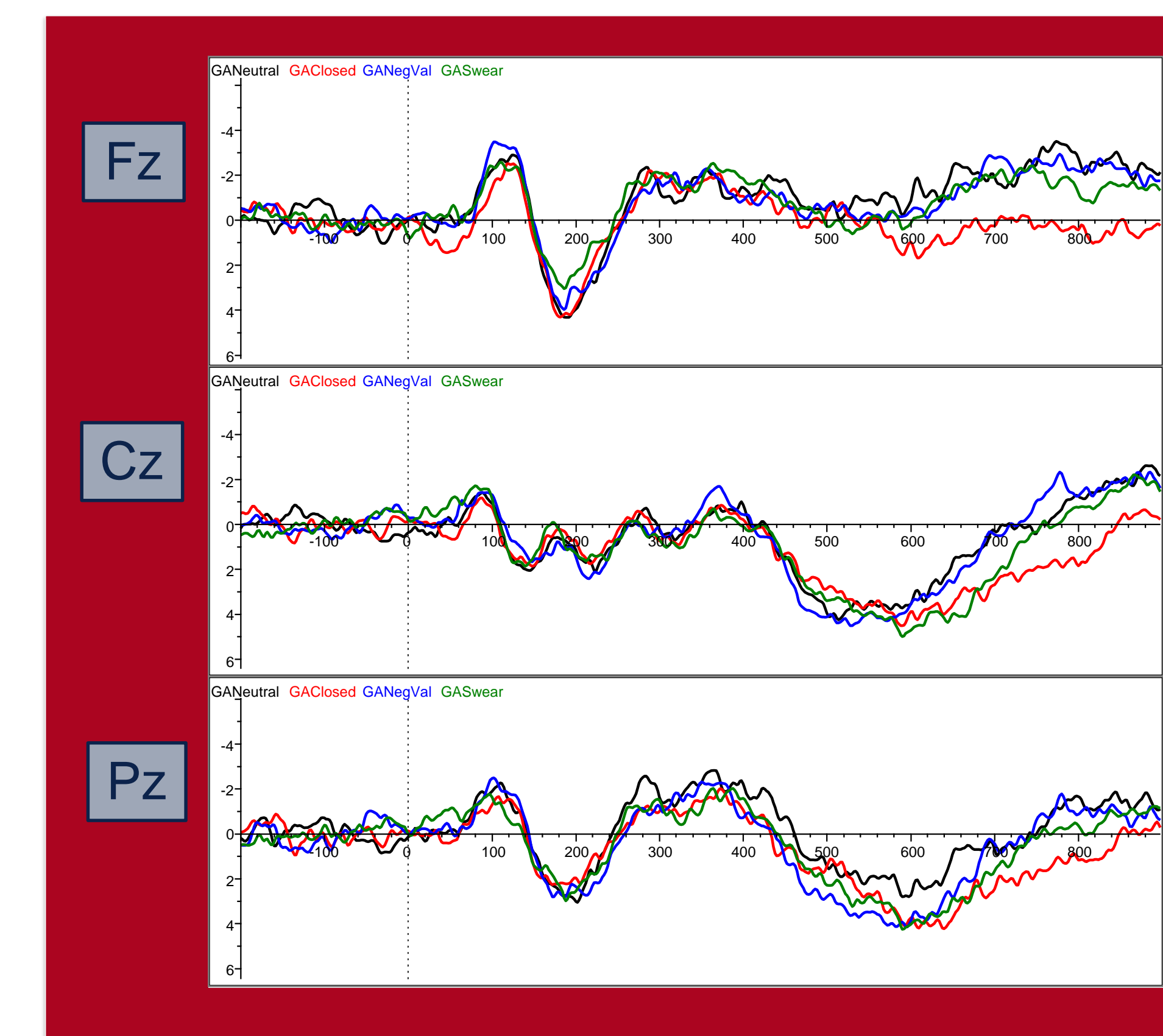
Results

- Behavioral results**

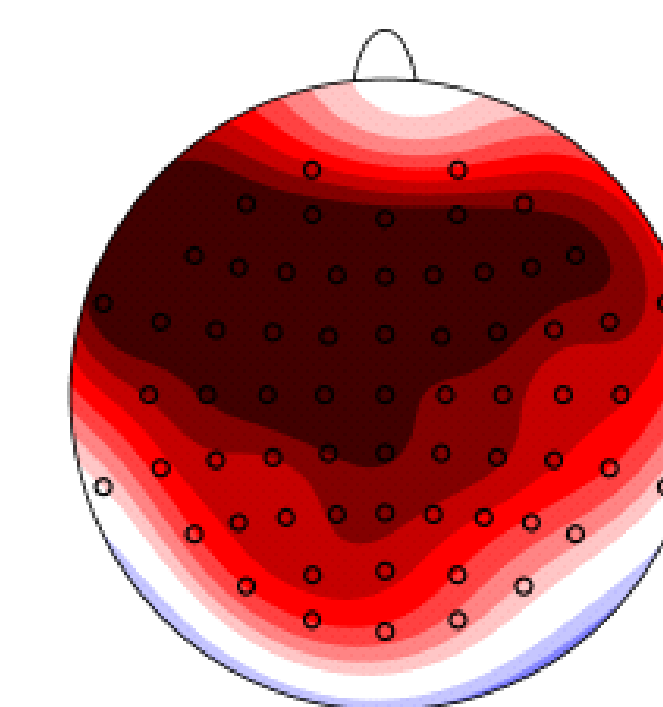
RTs in ms. Significance with respect to swear words as baseline.

Swear	Negative Valence	Open Class Neutral	Closed Class	Pseudo-words
547.1	511.7***	517.1**	557.8	598.5**

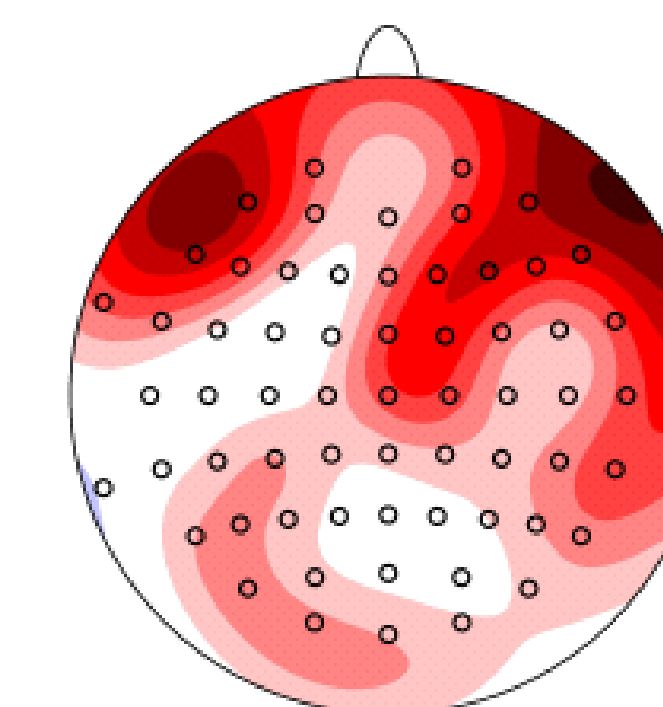
- Event Related Potentials: 550-750 ms**



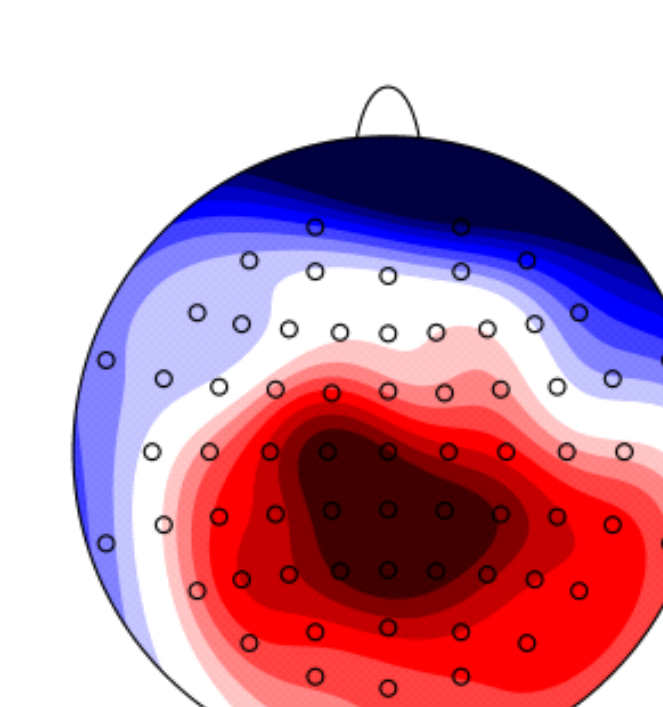
Closed-Neutral



Neg-Neutral



Swear-Neutral

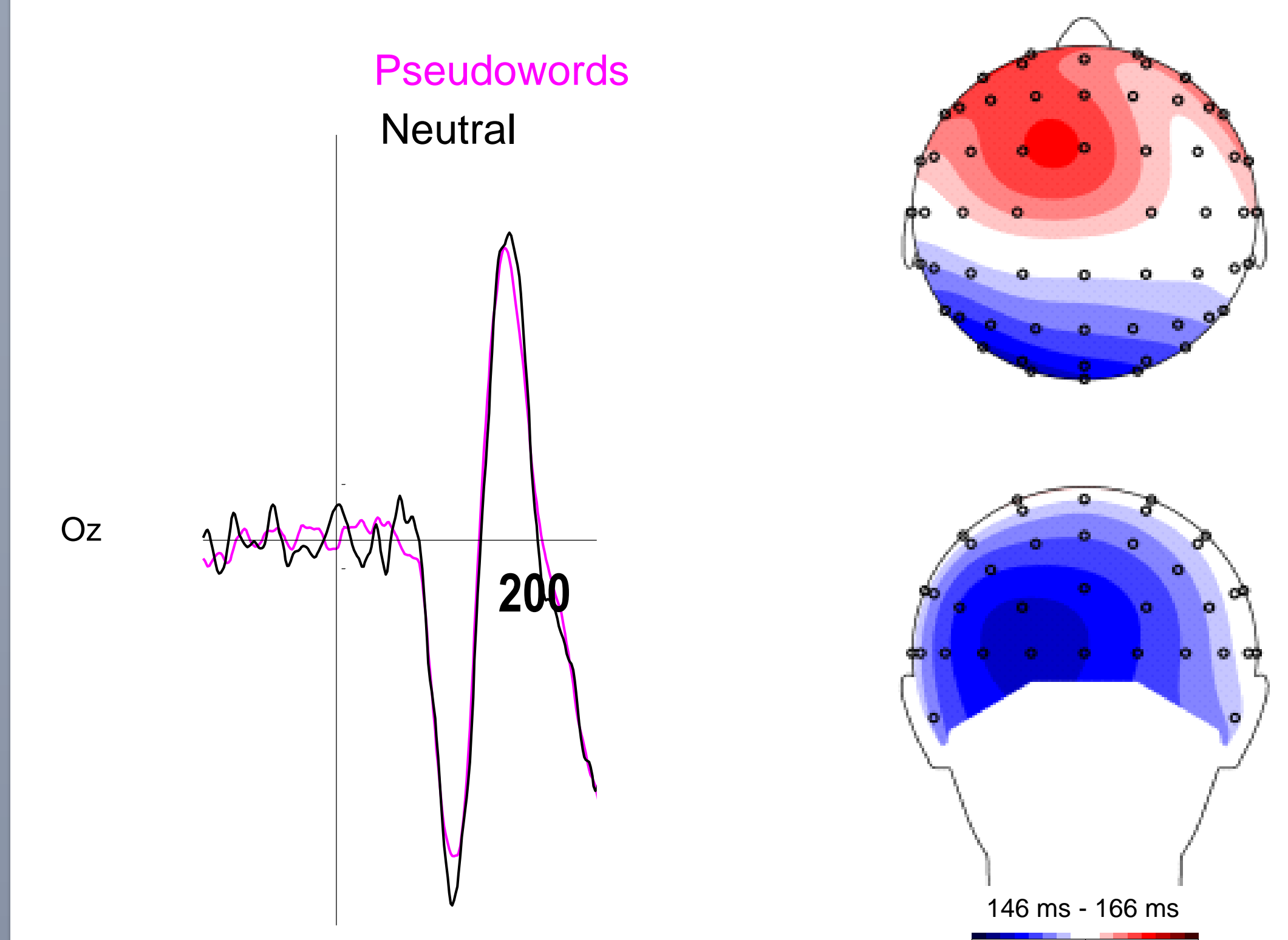


550 ms - 750 ms

-1.5 μV 0 μV 1.5 μV

Results (cont'd)

- Event Related Potentials: 145-165 ms**



Discussion

- Swear** words are more effortful in processing than **Neutral** words. Late positive component (LPC) challenges early processing accounts, e.g. Potts' principle of *immediacy*. NAI content contributes information, but appears to do so only later
- ERPs provide support for *independence*; **Swear** words contribute a dimension of meaning separate from the descriptive content of classes like **Neutral** words
- Both **Negative** words and **Swear** words elicited larger LPC than **Neutral** words, but the neural generators are at least partially dissociable
- Results support modified multidimensional account (Potts, 2007)

References

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