

## GOAL of current study:

To investigate how prosodic and lexical-semantic information is used to constrain sentence processing in neurologically unimpaired college-age adults.

✧ **Restricted accounts** of sentence processing are two-stage models where syntactic information takes precedence

- ✧ In **the garden-path account** listeners construct the simplest syntactic structure but will reanalyze if new information requires a more complex structure

✧ **Unrestricted accounts** (constraint-based) are one stage models where syntactic and non-syntactic information interact

- ✧ Multiple syntactic structures are built and the best one is chosen

✧ Garden-path sentences contain temporary syntactic ambiguities:

*While the band played **the song** pleased all the customers.*

✧ Role of **PROSODY**:

- ✧ Initially unclear whether **the song** is DO of *played* or subject of new clause
- ✧ Can the addition of a pause after *played* disambiguate the temporary syntactic ambiguity?
- ✧ If so, suggests prosodic information may immediately interact with syntax

✧ Role of **THEMATIC FIT (Plausibility)**:

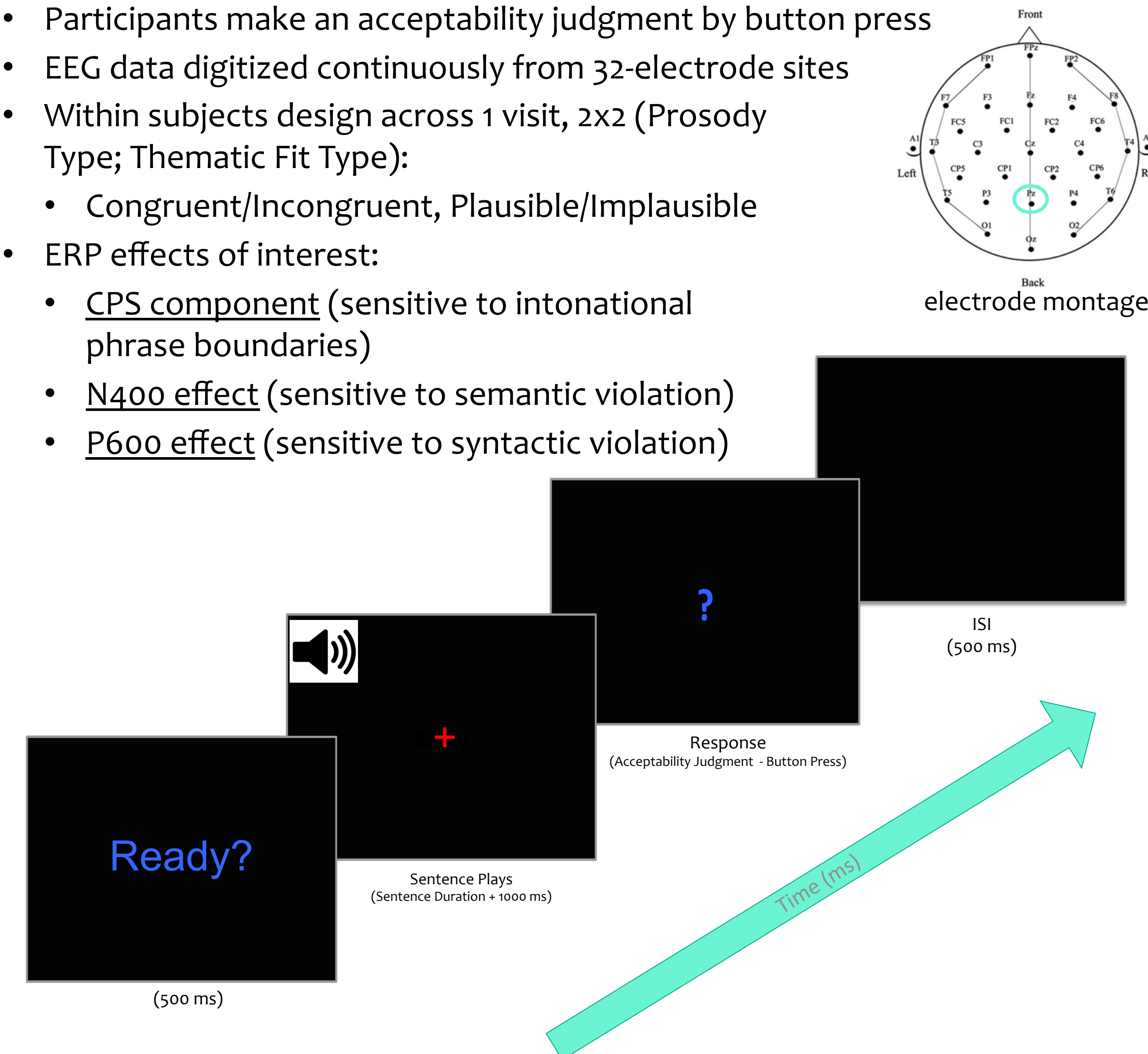
*While the band played **the beer** pleased all the customers.*

- ✧ Because **the beer** cannot be *played* it is an unlikely DO of *played* and is more likely to be the subject of an upcoming clause

✧ Does PROSODY interact with THEMATIC FIT during auditory sentence processing?

## Design & Procedure

- 240 experimental sentences (60 in each condition) presented aurally
- Participants make an acceptability judgment by button press
- EEG data digitized continuously from 32-electrode sites
- Within subjects design across 1 visit, 2x2 (Prosody Type; Thematic Fit Type):
  - Congruent/Incongruent, Plausible/Implausible
- ERP effects of interest:
  - **CPS component** (sensitive to intonational phrase boundaries)
  - **N400 effect** (sensitive to semantic violation)
  - **P600 effect** (sensitive to syntactic violation)

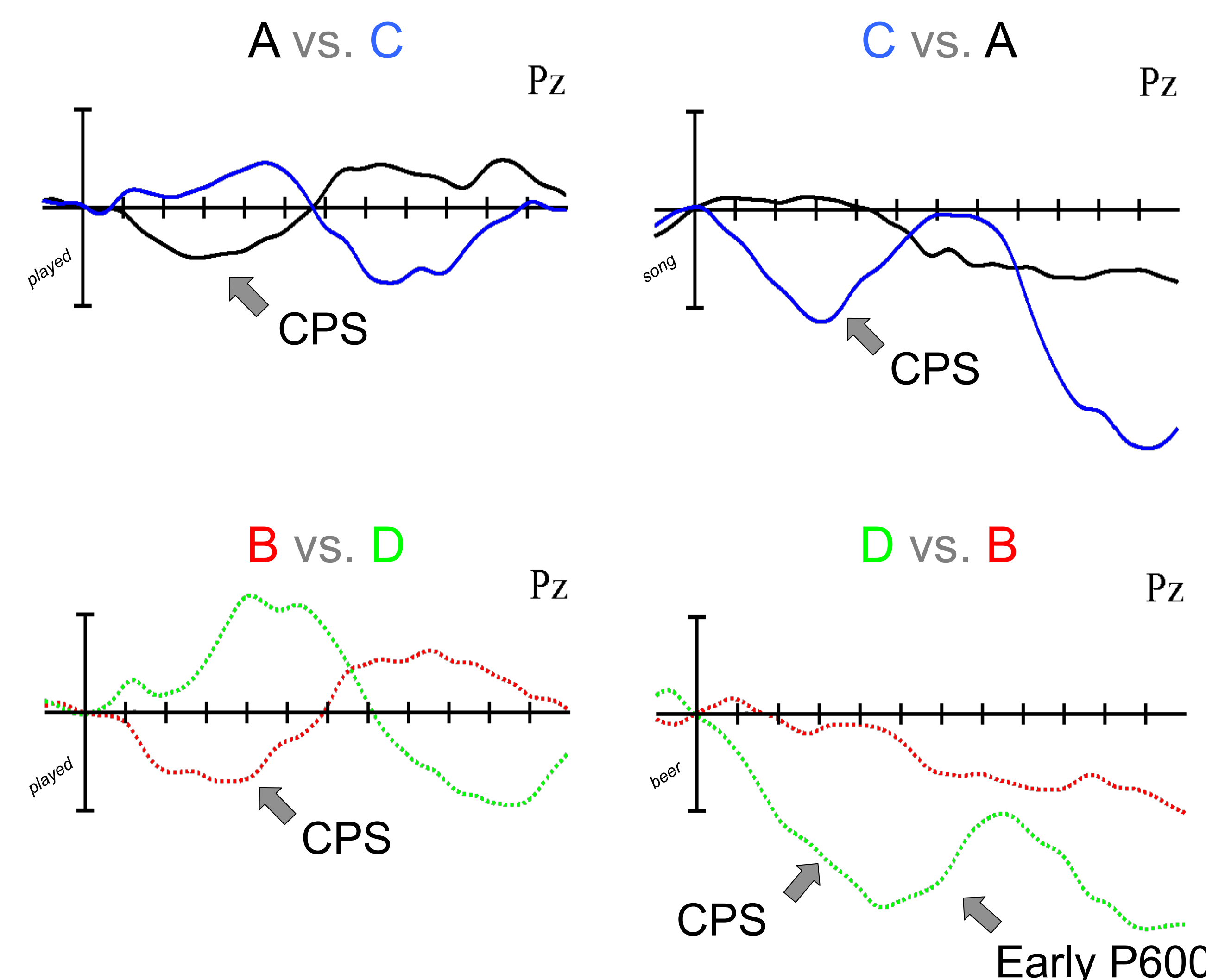


## Participants

- 25 San Diego State University college-age students, 19 females
- Mean age = 21 years
- Right-handed, monolingual English speakers

## Results

### Sensitivity to Prosodic Boundaries

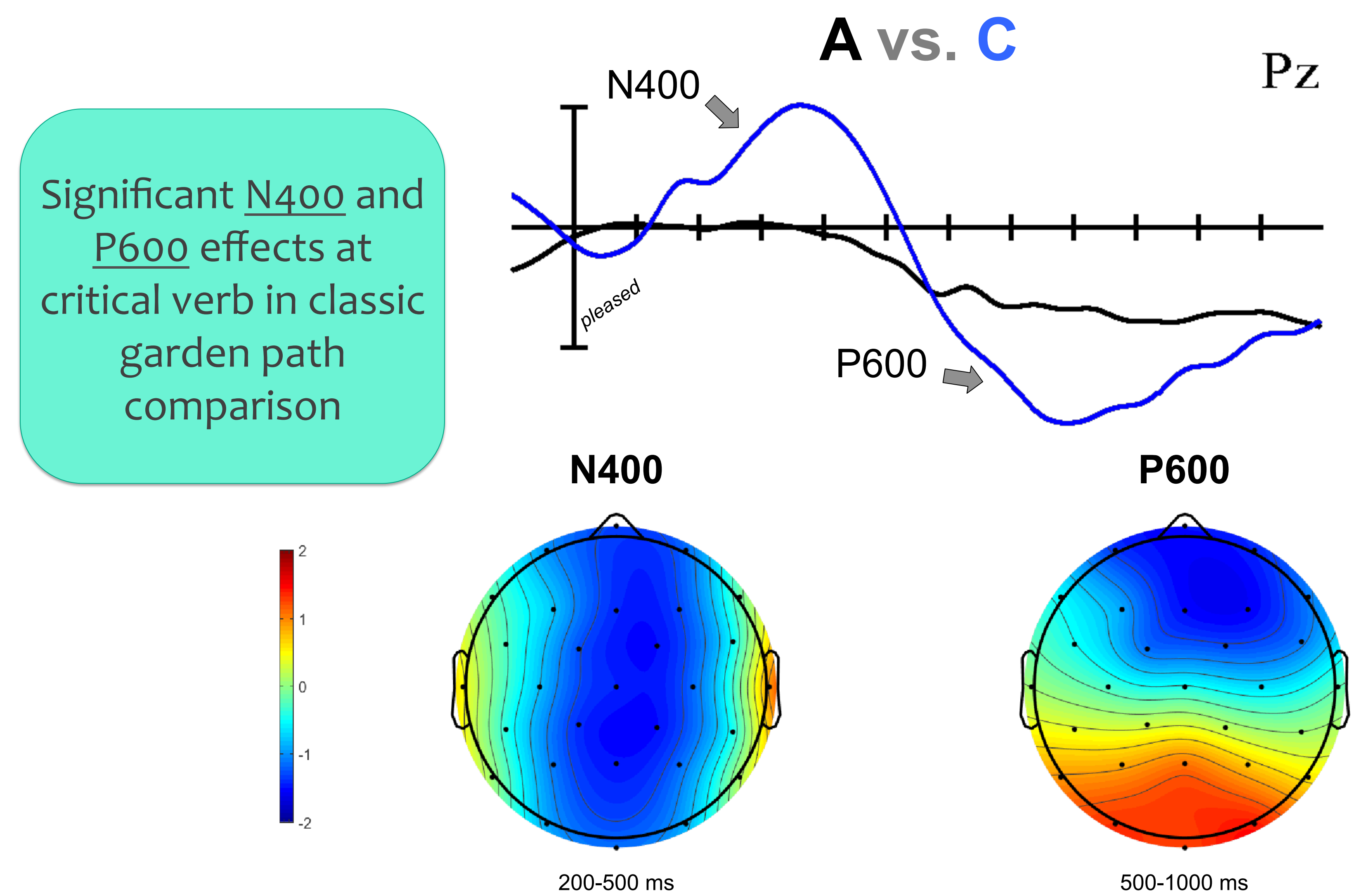


**Sensitive to Prosodic Break in All Conditions**

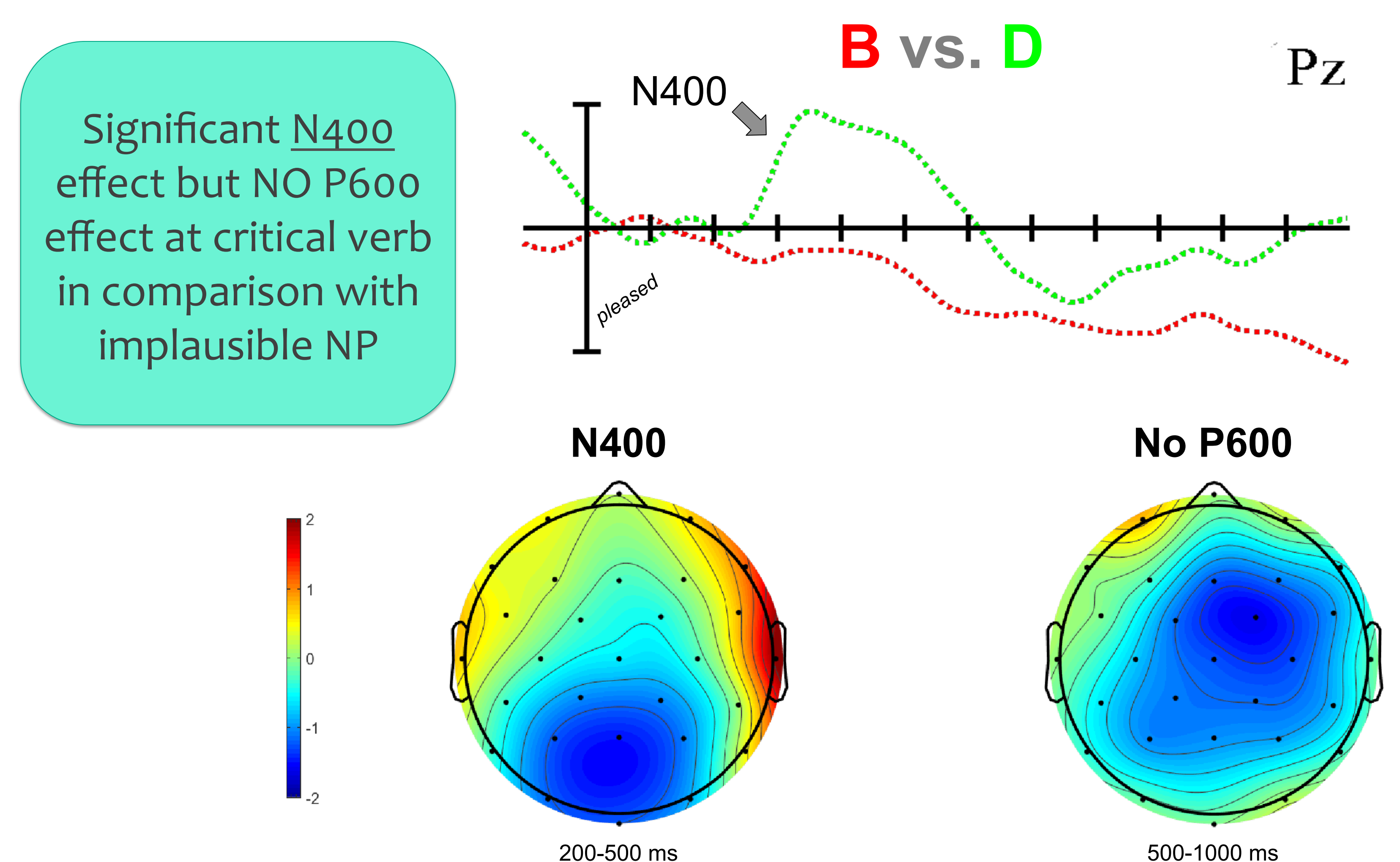
## Results

### Garden Path Effects at Critical Verb

#### Comparison 1 – Plausible NP (*song*)



#### Comparison 2 – Implausible NP (*beer*)



## Conclusions

- Participants sensitive to prosodic boundaries in all conditions (CPS)
- Early P600 effect found in **D** (at *beer*) suggests plausibility cue elicits an early syntactic reanalysis
  - Listeners use plausibility cues to predict correct syntactic structure
- N400-P600 Complex in classic garden path comparison suggests incongruent prosody immediately interacts with syntactic structure building
- Evidence of unrestricted account where syntactic information interacts immediately with prosodic and lexical-semantic information

| Sentence   | Prosody     | Thematic Fit |
|--|-------------|--------------|
| A. [While the band played] the song pleased all the customers. | Congruent   | Plausible    |
| B.*[While the band played] the beer pleased all the customers. | Incongruent | Plausible    |
| C. [While the band played the song] pleased all the customers. | Congruent   | Implausible  |
| D.*[While the band played the beer] pleased all the customers. | Incongruent | Implausible  |

\* [ ] indicates prosodic contour