A morpheme is the smallest unit of language that carries meaning. Bound morphemes are not words on their own, such as the suffix -ness or the prefix re- (Moats, 2005).

Event-related potentials (ERPs) are a recording of neural activity. The N400 component of the ERP reflects linguistic processing. Nonwords that are pronounceable (e.g., splak) elicit larger amplitude N400s than real words (e.g., pack; McKinnon et al., 2003).

Previous studies have shown that words made up of bound morphemes (e.g., retain, intrude) elicit the same N400 response as nonwords made up of the same morphemes rearranged (e.g., retrude, intain; McKinnon et al., 2003). These results suggest that morphemes are processed as discrete units at the neural level.

However, McKinnon et al. did not control for orthographic variables other than bigram frequency. With controlled stimuli, does the N400 differentiate between bound morpheme words and nonwords?

**METHODS**

**Participants**
- 11 subjects (6 F); average 20.4 years (SD 1.4)
- Monolingual, right-handed, normal vision, no history of language or neurological disorders

**Stimuli**
- 60 bound words (e.g., receive) and 60 bound nonwords (e.g., inceive)
- Button press judgment: word/nonword

**EEG Recording**
- Bandpass 0.01-100 Hz
- Sampling rate 4 ms
- 29 active electrodes
- Mastoids reference

**ERP Data Analysis**
- Repeated measures ANOVA with condition (word/nonword), hemisphere (left/right), anterior/posterior (6 levels), lateral/medial
- Mean amplitude, 300-500 ms

**RESULTS**

**Behavioral Accuracy**
- Words: 90.8% (SD 3.42)
- Nonwords: 84.4% (SD 6.14)
- \( t = 1.516, p = 0.16, ns \)

**ERP Results**
- Bound nonwords elicited a larger N400 than bound words (condition, \( p = 0.0006 \))
- This condition effect was larger at medial sites than at lateral sites (condition x lateral/medial, \( p = 0.0172 \))
- This condition effect was greatest across medial and posterior lateral sites (condition x anterior/posterior x lateral/medial, \( p = 0.0093 \))

**CONCLUSIONS**

- Bound nonwords elicited more N400 processing than bound words
- The brain distinguishes between bound words and nonwords, even though these stimuli are made up of the same morphemes (in different arrangement)
- This implies that the N400 is more sensitive to whole-word processing than to morpheme-level processing
- Controlling for orthographic factors is important in determining the sensitivity of the N400 (cf. McKinnon et al., 2003)

**REFERENCES**


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