DO U TXT?: An Event-Related Potential (ERP) study on the neural processing of Standard English versus Nu English

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INTRODUCTION
Nu English is a hybrid language derived from standard English, modified to facilitate ease of communication via instant and text messaging. ERPs were used to compare semantic processing in Standard English and Nu English sentences. Previous semantic studies with bilinguals have found that an N400 effect peaks later and extends longer in second language processing (e.g., Ardal et al., 1990; Hahne, 2001; Moreno & Kutas, 2005; Weber-Fox & Neville, 1996). We first measured the N400 effect in Nu English and Standard English to investigate if the effect could be elicited in the newly developed language, then compared across conditions.

METHODS
Participants. 16 female, right-handed, college students (mean age 20.5 years, SD 1.2); monolingual English speakers; screened for Nu English fluency.
Stimuli. 40 congruous and 40 incongruous sentences in each of 2 conditions: English and Nu English; button-press judgment each sentence (does/does not make sense).
ERP Measures. Bandpass .01-100 Hz; Sampling rate 4 ms; 32 channel recording; Right mastoid reference.

RESULTS
Accuracy. Overall 92% accurate on sentence congruency task.

- Effect of condition, p < .001

English and Nu English conditions.

- N400 mean amplitude (300-500 ms), peak latency (300-500 ms), and duration (500-700 ms)
- ANOVAs with factors: congruence (congruous, incongruous), condition (English, Nu English), hemisphere (left, right), anterior-posterior (6 levels), and lateral-medial
- Difference waves (incongruous-congruous waves) created to directly compare English and Nu English N400 effects

ERP Data Analysis

N400 Effect: Mean Amplitude (300-500 ms)

- English: mean -2.79 µV (SD 1.34); Nu English: mean -3.25 µV (SD 1.42)
- Effect of condition: ns, p = .266
- N400 effect similar size in English and Nu English

N400 Effect: Peak Latency (300-500 ms)

- English: mean 378.04 ms (SD 35.28); Nu English: mean 422.37 ms (SD 30.48)
- Effect of condition: p < .01
- N400 effect peaks earlier in English than Nu English

N400 Duration Effect: Mean Amplitude (500-700 ms)

- English: mean -0.31 µV (SD 1.71); Nu English: mean -2.38 µV (SD 1.86)
- Effect of condition: p < .01
- N400 effect lasts longer in Nu English than English

CONCLUSIONS

- A similar N400 semantic incongruity effect is elicited in English and Nu English
- The peak of the N400 effect in Nu English is later and the duration is longer than in English, similar to previous bilingual studies
- This is the first report to extend the bilingual N400 literature to include the technological phenomenon of Nu English

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