Print awareness and phonological awareness are some of the best predictors of success in learning to read (e.g., Adams, 1990). Letter name knowledge and rhyme recognition are basic measures of print and phonological awareness, respectively. Letter rhyme tasks can thus provide a simultaneous index of two crucial pre-reading/reading skill sets.

Event-related potential (ERP) studies have reported a visual rhyming effect: nonrhyming targets in prime-target stimulus pairs elicit more negative-going waveforms than rhyming targets. This has been observed with real words (e.g., Rugg, 1984a, 1984b), nonwords (e.g., Rugg, 1984a), and pictures (e.g., Barrett & Rugg, 1990) in adults, but few studies have investigated an ERP rhyming effect for single letters.

### METHODS

**Participants.** 30 (19 female) right-handed, monolingual English-speaking college students (mean 20;1, SD 1;4)

**Behavioral measures.** Phonological Awareness (PA) and Phonological Memory (PM) composites of the CTOPP (Wagner et al., 1999; Word ID and Word Attack subtests of the Woodcock (WRMT-R, Woodcock, 1987)

**ERP measures** (32 channel recording, bandpass .01-100 Hz, sampling rate 4 ms).
- 70 rhyming and 70 nonrhyming pairs in each of 3 conditions: **words** *(nail-male, paid-meet)*; **nonwords** *(chail-thale, kaid-blome)*; **letters** *(a-j, b-k)*
- button-press judgment each pair (rhyme/not rhyme)

**Data analyses.** ANOVAs on mean amplitude (320-550 ms); Pearson correlations with behavioral measures

### RESULTS

**Accuracy.** > 93% judgment accuracy

**ERPs rhyming effect.**
- typical ERP rhyming effect for **words** *(p < .001)*
- typical ERP rhyming effect for **nonwords** *(p < .001)*
- typical ERP rhyming effect for **letters** *(p < .01)*

### CONCLUSIONS

- Single letters can elicit an ERP rhyming effect
- Size of the ERP letter rhyme effect is correlated with scores on higher-level behavioral measures (sight word vocabulary, GPC rules) in college students
- ERP letter rhyme tasks might be used as an on-line, brain-behavior index of key skills in pre-, beginning, or struggling readers.

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**DIFFERENCE WAVES (nonrhyming-rhyming).**
- Post-hoc Bonferroni comparison: words *(p = .057)* and nonwords *(p = .086)* tend to elicit larger effect than letters

**Correlations** [between amplitude of the rhyming effect (C4, P4, and O2) and behavioral measures].
- word rhyming effect: no significant correlations
- nonword rhyming effect:
  - CTOPP PA *(r = -.478, p < .01)*
  - WRMT-R Word ID *(r = -.389, p < .05)*
- letter rhyming effect:
  - WRMT-R Word ID *(r = -.398, p < .05)*
  - WRMT-R Word Attack *(r = -.396, p < .05)*