

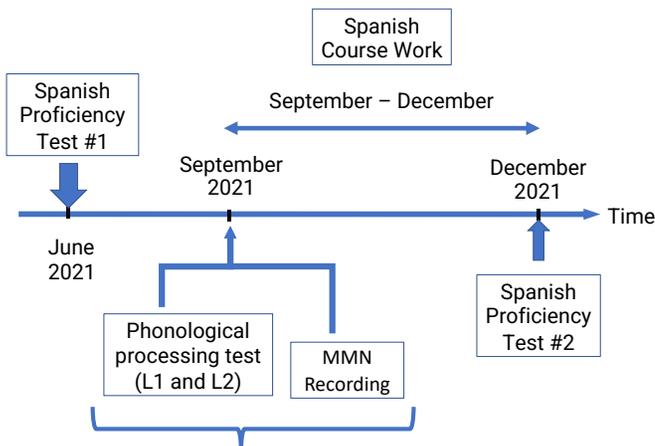
## Introduction

- Phonological processing in early childhood predicts later literacy development in first language acquisition
- Does this relationship apply to second language development later in life?
- Phonological processing can be measured by EEG, specifically looking at the brain wave called MMN

## Methods

- Recruited English native speakers on campus who were enrolled in Spanish intro-level classes
- Measured their phonological processing skills, general Spanish proficiency, and MMN

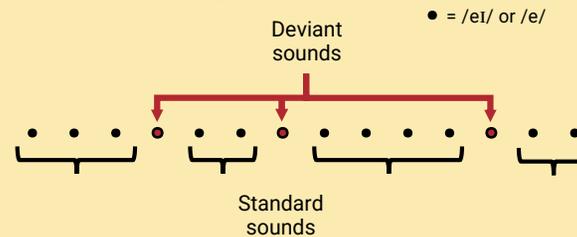
Figure 1. Timeline of the experiment.



## EEG and Stimuli

- Stimuli: English /eɪ/ and Spanish /e/ sound
- Oddball Paradigm
  - Listening to a sequence of standard and deviant sounds
  - Measures automatic attention paid to the deviant sound

Figure 2. Oddball paradigm example.



## Behavioral Results

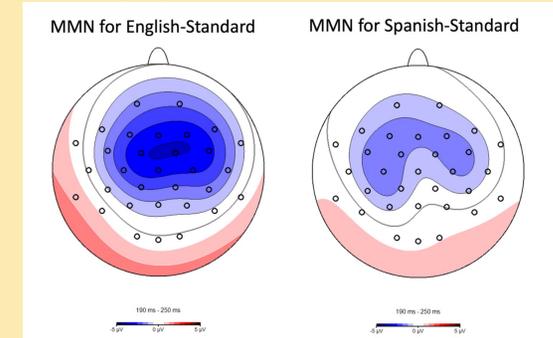
L1 = English, L2 = Spanish

- People who score higher in phonological processing test in L1 also scored higher in phonological processing test in L2
- Significant correlation between phonological processing scores in L1 and L2 improvement, but no significant correlation between phonological processing in L2 and L2 improvement
- Significant correlation between two Spanish tests at the beginning and at the end of the semester

## EEG Results

- 2 Conditions
  - English /eɪ/ as standard and Spanish /e/ as deviant
  - Spanish /e/ as standard and English /eɪ/ as deviant
- English standard elicited stronger MMN compared to Spanish standard

Figure 3. Topography of MMN in two conditions.



\*Deeper blue indicates stronger MMN

## Key Results

- Phonological processing in L1 and general L2 acquisition was correlated
- MMN in English-standard condition and phonological processing in L2

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