

The top left of Figure S3-A displays monolinguals' ERP responses and difference waveform (MMN) during the English language context. The violin plot at the bottom right of the head depicts Fz and TP9 mean amplitude distributions. Figure S3-B presents the visualization of the data-driven ERP analysis for monolinguals in the English language context. The left side of Figure S3-B shows the typical voltage maps associated with the MMN response. The right side of Figure S3-A displays monolinguals' ERP responses and difference waveform (MMN) during the Spanish language context. The violin plot at the bottom right of the head depicts Fz and TP9 mean amplitude distributions. Figure S3-B presents the visualization of the data-driven ERP analysis for monolinguals in Spanish. The right side of Figure S3-B shows the typical voltage maps associated with the MMN response.

Analysis

Confirmation of the presence of the MMN

MMN in monolinguals during the English Language Context

The entire time window in ERP response (-100 to 470 ms) was analyzed. Monolinguals showed cluster values of -5968.14 between 182 and 290 ms. The cluster value demonstrated a distinct probability distribution between standard and deviant ($p < .000001$) for electrodes Fz, F3, FC1, C3, CP1, Pz, CP2, Cz, C4, FC6, FC2, F4, AFz, F1, F5, FC3, C1, CP3, P1, P2, CPz, C2, FC4, F6, AF4, and F2. This strongly indicates a significant difference between standard (Mean = $-0.168 \mu\text{V}$, SD = $.793$) and deviant ($-0.628 \mu\text{V}$, SD = 1.06) ERP responses. Analyses of polarity inversion indicated that the Fz electrode exhibited a larger negative amplitude (Mean = $-0.274 \mu\text{V}$, SD = $.497$) than both mastoid electrodes (TP9 electrode = $.346 \mu\text{V}$, SD = $.571$; TP10 electrode = $.483 \mu\text{V}$, SD = $.522$).

Paired t-tests indicated a significant polarity inversion between Fz and TP9 (MFz-TP9 = $-0.620 \mu\text{V}$, SD = 1.00 , $p < .001$, $d = -0.620$; 95% CI $[-0.994, -0.246]$) and between Fz and TP10 (MFz-TP10 = $-0.757 \mu\text{V}$, SD = $.890$, $p < .001$, $d = -0.851$; 95% CI $[-1.09, -0.425]$). This polarity analysis validated the MMN. See Figure S3.

MMN in monolinguals during the Spanish Language Context

The entire time window in the ERP responses (-100 to 470 ms) was analyzed. Monolinguals had a cluster value of -21341.7 between 101 and 469 ms. The cluster value indicated a different probability distribution between standard and deviant ($p < .000001$) for electrodes Fz, F3, F7, FC5, FC1, C3, CP1, Pz, P3, O1, Oz, O2, CP2, Cz, C4, FC6, FC2, F4, F8,

AF3, AFz, F1, F5, FT7, FC3, C1, C5, CP3, P1, P5, PO7, PO3, POz, P2, CPz, C6, C2, FC4, F6, AF4, and F2. This strongly demonstrates a significant difference between standard (Mean = -.271 μ V, SD = .485) and deviant (Mean = -.640 μ V, SD = .622) ERP responses. Analyses of polarity inversion indicated that the Fz electrode exhibited a larger negative amplitude (Mean = -.413 μ V, SD = .487) than both mastoid electrodes (TP9 electrode mean = .500 μ V, SD = .474; TP10 electrode mean = .541 μ V, SD = .477).

Paired t-tests indicated significant polarity inversion between Fz and TP9 (MFz-TP9 = -.913 μ V, SD = .869, $p < .001$, $d = -1.05$; 95% CI [-1.23, -.588]) and between Fz and TP10 (MFz-TP10 = -.954 μ V, SD = .880, $p < .001$, $d = -1.08$; 95% CI [-1.28, -.626]). See Figure S3.