SUPPLEMENTARY MATERIAL 3. RESULTS OF ANALYSIS
WHERE EVOKED RESPONSES WERE KEPT

COHERENCE VALUES

Repeated measures mixed ANOVA (2 (type) x 2 (hemisphere) x 3 (age)) was conducted to investigate the differences in development for processing of stimulus content and hemispheres. False discovery rate (FDR) was calculated for correction for multiple comparisons.

Adults had the largest coherence values on average, while pre-school age group had the lowest values out of the three age groups in the delta and theta bands (see Supplementary Table 3.1: Age main effect; and Supplementary Figure 3.1).

Our results showed larger coherence values for words than for sentences for all frequency bands (Supplementary Table 3.1: Type main effect; Supplementary Figure 3.2).

Supplementary Table 3.1. Results of repeated measures mixed ANOVA for each frequency band.

| Main effects       | df  | F-value | p-value | partial $\eta^2$ |
|--------------------|-----|---------|---------|------------------|
| **Hemisphere**     |     |         |         |                  |
| Delta (1-4 Hz)     | 1.50| 5.416   | 0.024   | 0.098            |
| Theta (4-8 Hz)     | 1.50| 0.001   | 0.982   | 0.000            |
| Alpha (8-12 Hz)    | 1.50| 0.741   | 0.394   | 0.015            |
| Low Beta (12-20 Hz)| 1.50| 0.001   | 0.971   | 0.000            |
| High Beta (20-30 Hz)| 1.50| 1.835   | 0.182   | 0.035            |
| Low Gamma (30-45 Hz)| 1.50| 0.039   | 0.844   | 0.001            |
| **Age**            |     |         |         |                  |
| Delta (1-4 Hz)     | 2.50| 9.671   | <0.001  | 0.279            |
| Theta (4-8 Hz)     | 2.50| 5.065   | 0.010   | 0.168            |
| Alpha (8-12 Hz)    | 2.50| 0.071   | 0.931   | 0.003            |
| Low Beta (12-20 Hz)| 2.50| 0.130   | 0.878   | 0.005            |
| High Beta (20-30 Hz)| 2.50| 1.908   | 0.159   | 0.071            |
| Low Gamma (30-45 Hz)| 2.50| 0.058   | 0.944   | 0.002            |
| **Type**           |     |         |         |                  |
| Delta (1-4 Hz)     | 1.50| 396.743 | <0.001  | 0.888            |
| Theta (4-8 Hz)     | 1.50| 556.609 | <0.001  | 0.918            |
| Alpha (8-12 Hz)    | 1.50| 211.793 | <0.001  | 0.809            |
| Low Beta (12-20 Hz)| 1.50| 563.857 | <0.001  | 0.919            |
| High Beta (20-30 Hz)| 1.50| 381.404 | <0.001  | 0.884            |
| Low Gamma (30-45 Hz)| 1.50| 731.594 | <0.001  | 0.936            |
| **Interactions**   |     |         |         |                  |
| Hemisphere x Age   |     |         |         |                  |
| Delta (1-4 Hz)     | 2.50| 3.399   | 0.041   | 0.120            |
| Theta (4-8 Hz)     | 2.50| 0.063   | 0.939   | 0.002            |
| Alpha (8-12 Hz)    | 2.50| 0.116   | 0.890   | 0.005            |
| Low Beta (12-20 Hz)| 2.50| 0.856   | 0.431   | 0.033            |
| High Beta (20-30 Hz)| 2.50| 2.136   | 0.129   | 0.079            |
| Low Gamma (30-45 Hz)| 2.50| 1.963   | 0.151   | 0.073            |
| Hemisphere x Type  |     |         |         |                  |
| Delta (1-4 Hz)     | 1.50| 1.398   | 0.243   | 0.027            |
| Theta (4-8 Hz)     | 1.50| 3.147   | 0.082   | 0.059            |
| Alpha (8-12 Hz)    | 1.50| 0.432   | 0.514   | 0.009            |
| Low Beta (12-20 Hz)| 1.50| 2.285   | 0.137   | 0.044            |
| High Beta (20-30 Hz)| 1.50| 0.227   | 0.636   | 0.005            |
| Low Gamma (30-45 Hz)| 1.50| 0.457   | 0.502   | 0.009            |
| Age x Type         |     |         |         |                  |
| Delta (1-4 Hz)     | 2.50| 3.709   | 0.031   | 0.129            |
| Theta (4-8 Hz)     | 2.50| 0.100   | 0.905   | 0.004            |
| Alpha (8-12 Hz)    | 2.50| 0.918   | 0.406   | 0.035            |
| Low Beta (12-20 Hz)| 2.50| 1.233   | 0.300   | 0.047            |
High Beta (20-30 Hz) 2.50 0.058 0.943 0.002
Low Gamma (30-45 Hz) 2.50 3.270 0.046 0.116

Hemisphere x Age x Type

| Frequency Band | Hemisphere x Age x Type | t Value | p Value |
|----------------|-------------------------|--------|---------|
| Delta (1-4 Hz) | Hemisphere x Age x Type | 2.50   | 0.020   |
| Theta (4-8 Hz) | Hemisphere x Age x Type | 2.50   | 0.006   |
| Alpha (8-12 Hz) | Hemisphere x Age x Type | 2.50   | 0.003   |
| Low Beta (12-20 Hz) | Hemisphere x Age x Type | 2.50   | 0.003   |
| High Beta (20-30 Hz) | Hemisphere x Age x Type | 2.50   | 0.003   |
| Low Gamma (30-45 Hz) | Hemisphere x Age x Type | 2.50   | 0.003   |

Note: Bold values remained significant after false discovery rate correction.

Supplementary Figure 3.1 Topographic distribution of the coherence values and box plots of the delta and the theta frequency bands showing Age main effect in the repeated measures mixed ANOVA for the three age groups (Pre-school age, N=12; School age, N=22; Adults, N=19) collapsed across hemispheres and stimulus types. Topographies: warmer colours reflect higher coherence between the stimuli envelope and the brain data. Right box plots: Red bolded lines denote the median of the coherence values, the bottom and top edges of the box indicate the 25th and 75th percentiles, respectively. (P = Pre-school age, S = School age, A = Adults).

The main effect of Age found in the ANOVA was further examined with Independent samples T-tests. Adults had larger coherence values than pre-school age children in both the delta (t(29) = -3.083, p = 0.004) and theta bands (t(29) = -3.887, p = 0.001). Similarly, coherence values were larger for adults than for school age children in both the delta (t(39) = -3.192, p = 0.003) and theta bands (t(39) = -2.229, p = 0.032). No significant differences were found between the other age comparison (delta: pre-school age group vs school age group (t(32) = -1.556, p = 0.130); theta: pre-school age group vs school age group (t(32) = -1.079, p = 0.288)).

Overall, adults had the largest coherence values on average, while pre-school age children had the lowest average values out of the three age groups.
Supplementary Figure 3.2 Topographic distribution of the coherence values and box plots of all frequency bands showing Type main effect in the repeated measures mixed ANOVA collapsed across hemispheres and ages. Topographies: warmer colours reflect higher coherence between the stimuli envelope and the brain data. Boxplots: Red bolded lines denote the median of the coherence values, the bottom and top edges of the box indicate the 25th and 75th percentiles, respectively. (W: words, S: sentences)