

## **Additional Methodological Details**

### *Participants*

Adult participants were all right-handed and had normal or corrected to normal sight. All infants were born full term (gestational age: 37 to 41 weeks) in the normal weight range (> 2500 g). The minimum inclusion criterion for the infants was at least 10 artifact-free trials in each of the two experimental conditions. Ethical approvals were obtained from the ethics committee of the Central European University, Budapest. Parents gave written informed consent for their children's participation in the study. Infants received a toy for participating.

### *Stimuli*

Given that in Hungarian there are no norms for infant word comprehension, we selected the words for this study by asking parents of 12-month-old infants coming to the lab for other studies to check a list of object labels and mark the ones they believed their infant understood. We obtained a list of 18 object labels, and 15 of those have been selected for this study (see Table 1). The words were recorded by an actress and digitized on computer files at 32 bits, 48 kHz sampling rate. The average duration of the words was 559 ms, ranging from 419 to 784 ms.

The pictures of the 15 objects were laid on black background and their average size was 302.5 x 321.6 pixels. For each visual stimulus we created a short video clip that also included an occluder (a colorful rectangle 343 x 363 pixels). In the clips, the occluder moved down with a forward motion (a 90° rotation on the basis-hinge) revealing the object behind it. All visual stimuli were presented on a 19-inch, 800 x 600, 100 Hz computer monitor, using PsychToolBox (v. 3.0.8) and custom-made Matlab® scripts.

### *Experimental set-up*

Infants sat 70 cm from a CRT monitor. The experimental procedure consisted of 4 blocks of 60 trials. Each word was presented 4 times per block: two times followed by a congruous and two times followed by an incongruous object. The occluder appeared on the monitor at the beginning of the blocks and was continuously present for the whole block. A moving attention grabber was displayed on top of the occluder surface. Six different attention grabbers were used, one in every 10 trials. In each trial, on the experimenter key press, the attention grabber stopped moving for a random time between 600 and 800 ms, then it disappeared and the movie clip started, revealing an object behind the occluder. The inter-trial interval had random duration between 1100 and 1300 ms. The presentation order of the trials was pseudo-randomized with the following constraints: no more than two consecutive identical words in a row; no more than two consecutive trials of the same kind in a row, either congruous or incongruous.

Trials were presented as long as the infants were attentive. If they became distracted, a rotating spiral with a jingle was presented. If infants became fussy, the experimenters gave a short break to them. The session ended when the infant's attention could no longer be attracted to the screen.

#### *EEG Acquisition*

High-density EEG was recorded continuously using Hydrocel Geodesic Sensor Nets (Electrical Geodesics Inc., Eugene, OR, USA), 124 scalp locations (128 for the adults) referenced to the vertex (Cz). The ground electrode was at the rear of the head (between Cz and Pz). The electro-oculogram was recorded from electrodes positioned above (and below for the adults) both eyes and at the outer canthi. Electrophysiological signals were acquired using Electrical Geodesics Inc. amplifier, with a band-pass filter of 0.1-200 Hz, sampling rate 500 Hz.

*EEG data reduction*

The EEG was offline band-pass filtered between 0.3-30 Hz. Each ERP epoch included 380 ms before the visual stimulus onset (i.e., before the top of the object appeared behind the occluder), and 1320 ms following stimulus onset. The first 200 ms of the epoch (-380 to -180 ms) were used for baseline correction of the whole epoch. The segment between 0 and 1320 ms included 320 ms of occluder moving down and 1000 ms of fully visible object with no occluder movement. Data were automatically rejected for body and eyes movements whenever the average amplitude of a 80 ms gliding window exceeded 55  $\mu\text{V}$  at horizontal EOG channels, 140  $\mu\text{V}$  at vertical EOG channels, and 200  $\mu\text{V}$  at any other channel. Bad channels were automatically interpolated in epochs in which  $\leq 10\%$  of the channels contained artifacts; epochs in which  $> 10\%$  of the channels contained artifacts were automatically rejected. Data were also manually edited by visual inspection of each individual epoch. ERPs were finally re-referenced to the average reference.

Adult subjects contributed in average 84.17 good trials to the congruous condition (SD 16.55; range: 61 to 113) and 85.42 to the incongruous condition (SD 16.09; range: 64 to 114). Infants in the Mother-speech condition contributed 20.29 good trials to the congruous condition (SD 6.08; range: 10 to 34) and 20.29 to the incongruous condition (SD 6.28; range: 11 to 34); infants in the Experimenter-speech condition contributed 19.36 good trials to the congruous condition (SD 6.34; range: 13 to 30) and 19.93 to the incongruous condition (SD 7.88; range: 13 to 39).

We selected the following regions of interest (ROIs) for both adult and infant participants: on the left hemisphere channels 13, 29, 30, 36, 37, 42, 52,53, 54, 60, 61 (roughly corresponding to F3, C3 and P3 in the 10-20 international system); on the

right hemisphere channels 78, 79, 85, 86, 87, 92, 93, 104, 105, 111, 112 (F4, C4 and P4).

## **Additional Analyses**

### *ERPs measures*

Non-parametric statistics showed that 10 out of 12 adults and 11 out of 14 infants in the Mother-speech condition showed the N400 effect (Wilcoxon's  $Z = -2.43$ ,  $P = .015$  and  $Z = -2.07$ ,  $P = .038$  respectively).

*Table 1*

Hungarian Words	English Translation	
Alma	Apple	
Autó	Car	
Banán	Banana	
Kacsa	Duck	
Cica	Kitten	
Cipő	Shoe	
Kanál	Spoon	
Könyv	Book	Used
Kutya	Dog	
Labda	Ball	
Maci	Teddy	
Nyuszi	Bunny	
Pohár	Cup	
Telefon	Phone	
Zokni	Socks	
Baba	Baby	
Hinta	Swing	Not Used
Lámpa	Lamp	