

Supplement to MOTHER-INFANT SOCIAL GAZE DYNAMICS RELATE TO INFANT BRAIN ACTIVITY AND WORD SEGMENTATION

Supplementary Material 1

Before or after free-play, infants underwent the same word segmentation task as reported in Vanoncini et al. (2022) with a central fixation paradigm (Cooper & Aslin, 1990). Infants sat in a baby car seat in front of the screen, approximately 55 cm from an arm-mounted EyeLink 1000 eye tracker sampling at 500 Hz with a 16 mm lens. The visual stimuli were displayed on a 21.5 inch BenQ GL2250 – LED screen. The audio stimuli were played at an intensity of around 65 dB, through two Logitech Z200 speakers located behind the screen. Mothers were instructed to sit right behind the infant and not to interact with the infant. After a 3-point calibration procedure, the experiment started.

Auditory stimuli were taken from Bartels et al. (2009). In a between-subjects design, we familiarized the infants with auditory passages in German containing two target words: for half of the infants (group A) the target words were *Pinsel* and *Felsen* (English: paintbrush, rock); for the other half (group B) the target words were *Balken* and *Kurbel* (English: beam, crank). Each passage contained 6 sentences, each sentence presented one target word (i.e., *Pinsel*, *Felsen* or *Balken*, *Kurbel*) at different sentence positions (i.e., at the beginning, in the middle, or at the end). Each text passage was repeated twice, resulting in a total of 4 familiarization trials. Before each trial, a colorful rotating wheel appeared as attention grabber on screen. Once the infant fixated the attention grabber, the auditory text passage started and a colorful checkerboard with blinking squares was presented. The audio was played until the end of the familiarization phase, which lasted for about 80 s.

After the familiarization phase, all infants received the same 12 test trials. Each test trial contained different utterances of the same word for a maximum of 32 s with an interstimulus interval of 600 ms; thus, the number of words was: *Balken* repeated 31 times, *Felsen* 27, *Kurbel* 28, *Pinsel* 28. The words *Pinsel* and *Felsen* were familiar for group A and novel for group B; the words *Balken* and *Kurbel* were novel for group A and familiar for group B. Before each trial, a colorful rotating wheel accompanied by a sound (baby laughter, bike bell, or bird song) was presented as attention grabber. Once the infant fixated the attention grabber, LTs (in milliseconds) were measured during the repeated auditory presentation of the (novel or familiar) word and the simultaneous presentation of the colorful blinking checkerboard. The duration of test trials was infant-controlled: If the infant looked away from the screen for more than 2 seconds, the presentation was terminated and the attention grabber started. Once the infant's look returned to the screen, the next test trial started. The order of the test trials was pseudorandomized.

References

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- Cooper, R. P., & Aslin, R. N. (1990). Preference for infant-directed speech in the first month after birth. *Child Development*, *61*(5), 1584–1595. <https://doi.org/10.2307/1130766>
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