

EEG Face Emotion

EEG RECORDING - GENERAL SET-UP

During the study infants sat on their parent's lap or on a highchair facing at approximately 65 cm distance a 23-inch Full HD IPS LG black computer monitor (refresh rate 60 Hz, 1920 x 1080 resolution, full details: LG 23MB35PM-B; dimensions in cm 51.3 (w) * 28.7 (h); screen calibrated at 120 candela/m²). There are two possible infant labs: room 0.41 and room 0.42. Each testing room is semi-dark and controlled for luminance (between 8-20 lux, usually around 12 ± 2) and temperature (between 18-25°). Parents were instructed not to interact with their child during the experiment. A video camera (HD pro webcam C920; cf. <https://www.logitech.com/nl-nl/product/hd-pro-webcam-c920>) sampling at 15Hz placed below the screen recorded the child's behaviour. By using ffmpeg tools through the Matlab and recording laptop interface, we could timestamp frames from the video to correspond with the onset of each trial: the video also 'received' a binary code block in the top left of the video, which allows for (automatic) trial trigger code lookup to scroll to only task-relevant video-frames. (Note that we have home-build software to accomplish this; 'videocoder').

Continuous EEG was recorded using a 32-channel ActiveTwo BioSemi system (Amsterdam, Netherlands), configured to the standard International 10-20 System (channels: 28 lateral channels FP1/2; F7/8; F3/4; AF3/4; FC1/2, FC5/6, C3/4, T7/8, CP1/2, CP5/6, P3/4, P7/8, O1/2, PO3/4, plus 4 midline channels Fz, Cz, Pz, Oz). For some children, an additional eye-electrode was placed behind the child's left eye (Ex3), and/or additional loose electrodes were positioned at the mastoids (Ex1-2). Electrodes offset were less than 20µv. The EEG data were recorded relative to common mode sense and driven right leg (CMS/DRL) electrodes placed near Cz. Continuous EEG was acquired at a 2048Hz sample rate

using Actiview (version 7.05) from a Dell latitude E5540 laptop (operating system Windows 10 Professional; in lab 0.41 version details: i5-4310U CPU @ 2,00 GHz 2,60GHz 8GB; in lab 0.42, version details: i3-4010U CPU @ 1,70 GHz 1,70GHz 4GB). Tasks were programmed in Matlab using Psych-Toolbox 3 (Brainard & Vision, 1997) from a second laptop (MacBookPro 11,1 13 inch retina OSX 10.9.5 Intel Core i7 2,8 GHz 16GB 1600 MHz DDR3). Roy van Koten was the person who programmed all tasks.

General markers: - begin and end of a task (250, 251 respectively)

- Begin and end of a pause (124, 125 respectively)
- Attention grabbers: sound (120) or video clip (121)
- Quit task: 122 (but cancelling the quit-command will give you 123)

STIMULI

Stimuli were coloured pictures of six female and six male models posing once with a happy and once with a fearful expression, selected from the Radboud Faces Database (females identities: 12, 22, 26, 27, 37, 61; males identities: 7, 15, 25, 36, 49, 71; Langner et al., 2010). These were the same models as presented in the FaceHouse task preceding the face-emo task (but there they were posing with a neutral expression). The stimuli were depicted on a grey background (RGB: 108) and measured 20.5 cm width x 22.5 cm height (visual angle: 19.4°x 21.2°). During the inter-stimulus intervals (ISI), infants saw a 5.3 x 5.3 cm square in the middle of the screen, which was composed of four coloured squares (red, yellow, blue and green; visual angle: 4.7° x 4.7°).

PROCEDURE

During the task infants passively watched trials consisting of pictures of faces

posing with a happy or a fearful expression. Trial duration was 1000 ms, with a jittered ISI between 700 and 1000 ms. There were 96 trials: 48 in the happy face condition (4 x 12 models) and 48 in the fearful face condition (4 x 12 models). Order of stimuli were pseudo-randomized: per block of 24 trials (4 blocks in total) all pictures appeared once in a randomized order. Between blocks and whenever the infant was not looking at the screen, the experimenter played additional sounds or video clips as attention getters. The task lasted approximately 3-4 minutes. This task was always presented after the FaceHouse task, but not always immediately: for some children, the Coherence task was presented in between.

Task-specific Markers: trial structure was such that 50 ms prior to onset of stimulus a marker was presented that correspond to trial identity (1-96) to allow for alignment with the video recordings (that contain information whether/not the child was attending the screen; note that these markers were at the same time also send to the webcam videos). The next three-digit marker corresponded to the onset of the picture stimulus with the last digit being informative about the category (xx4/5 happy faces; xx7/8 fearful faces).

Marker	134	135	144	145	154	155	164	165	174	175	184	185
Happy Face	Female #1	Male #1	Female #2	Male #2	Female #3	Male #3	Female #4	Male #4	Female #5	Male #5	Female #6	Male #6
Marker	137	138	147	148	157	158	167	168	177	178	187	188
Fearful face	Female #1	Male #1	Female #2	Male #2	Female #3	Male #3	Female #4	Male #4	Female #5	Male #5	Female #6	Male #6