Course Data Description

Participants

Data was collected from 17 healthy volunteers recruited from the University of Western Ontario. Participant age and sex were not recorded. Scans for three subjects were not analyzed. One showed excessive/abrupt motion and two more had only 5 main experiment scans available (fewer than the 6 used for most analysis). All participants had normal or corrected-to-normal vision and were financially compensated. Informed consent was obtained prior to scanning. All experimental procedures were approved by the University of Western Ontario's Health Sciences Research Ethics Board.

Experimental Design and Timing

Localizers

The experimental stimuli used were designed to localize brain regions selective to three categories of visual stimuli: faces, hands, and bodies. Scrambled versions of the images formed a fourth stimulus category. Participants were instructed to maintain their gaze on a central fixation point, which was also presented on a blank screen during baseline periods. Participants monitored the stream of visual stimuli for repetitions (a one-back task) to maintain attention.

Images were presented to subjects according to a conventional block design, with a block duration of 16s. Four cycles of four blocks (faces, hands, bodies, scrambled images) were presented in each run. Baseline blocks occurred at the beginning and end of each run and between cycles. The total run duration was 336 s (21 blocks x 16 s/block). Each stimulus block consisted of 16 stimuli, each presented for 0.8 s with a 0.2 s intertrial interval. The order of blocks within cycles was balanced such that for a run, each category was presented once in each of the first, second, third and fourth part of the cycle. Two runs with two different orders were collected. The order for *Localizer 1* is visualized by Figure 1. Examples of localizer stimuli are shown in Figure 2.

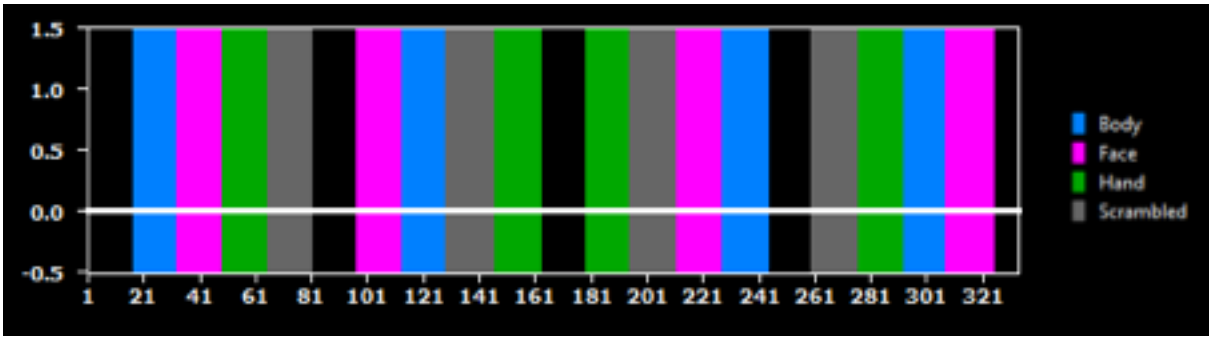


Figure 1: Protocol for Localizer 1.

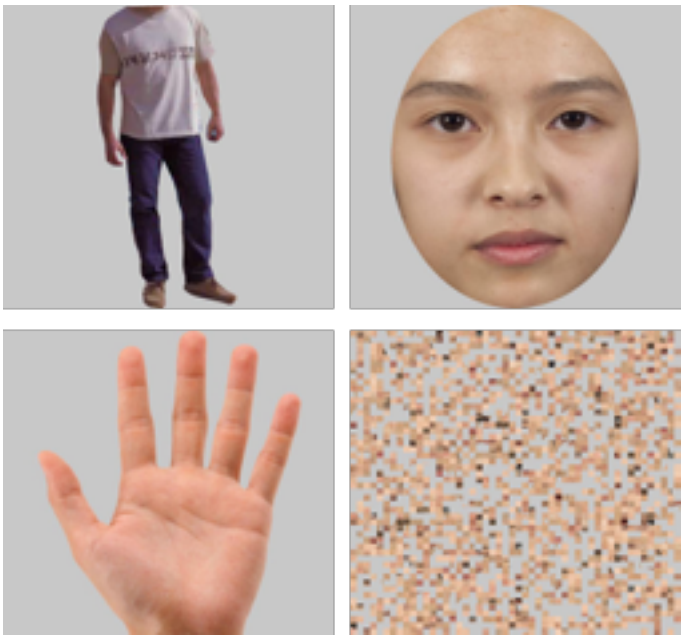


Figure 2: Example stimuli for localizers.

Main Experiment

Experimental stimuli formed a 2 x 3 factorial design with image category (faces/hands) and orientation (left/centre/right). Orientation indicated direction of eye gaze and direction of pointed index finger, for faces and hands, respectively. A static fixation point and a one-back task was also used in the main experiment.

Images were presented according to an event-related design with a total run duration of 280s. 16s baseline blocks occurred at the beginning and end of each run. The remaining 248s were divided into 62 trials (4s / trial). According to 10 different, shuffled run orders, a balanced subset of the visual stimuli was presented over 51 trials (including 3 one-back stimuli). The remaining 11 trials were randomly interspersed non-consecutive null stimuli. Six runs with six different orders were collected. For each subject, a different combination of run orders (210 possible) was used. An example of one experimental run order is visualized by Figure 3. Examples of stimuli used in experimental runs are shown in Figure 4.

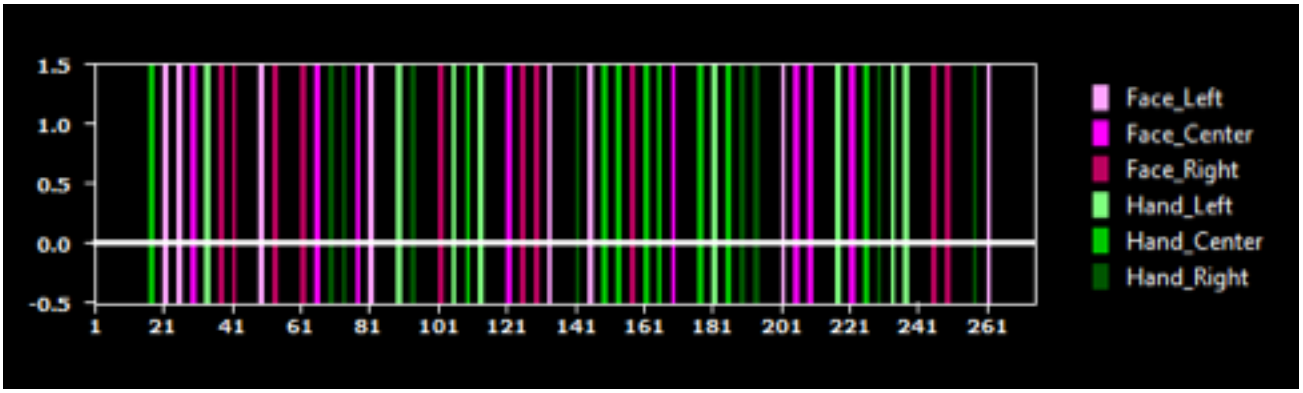


Figure 3: Example protocol for experimental run (Order 3).

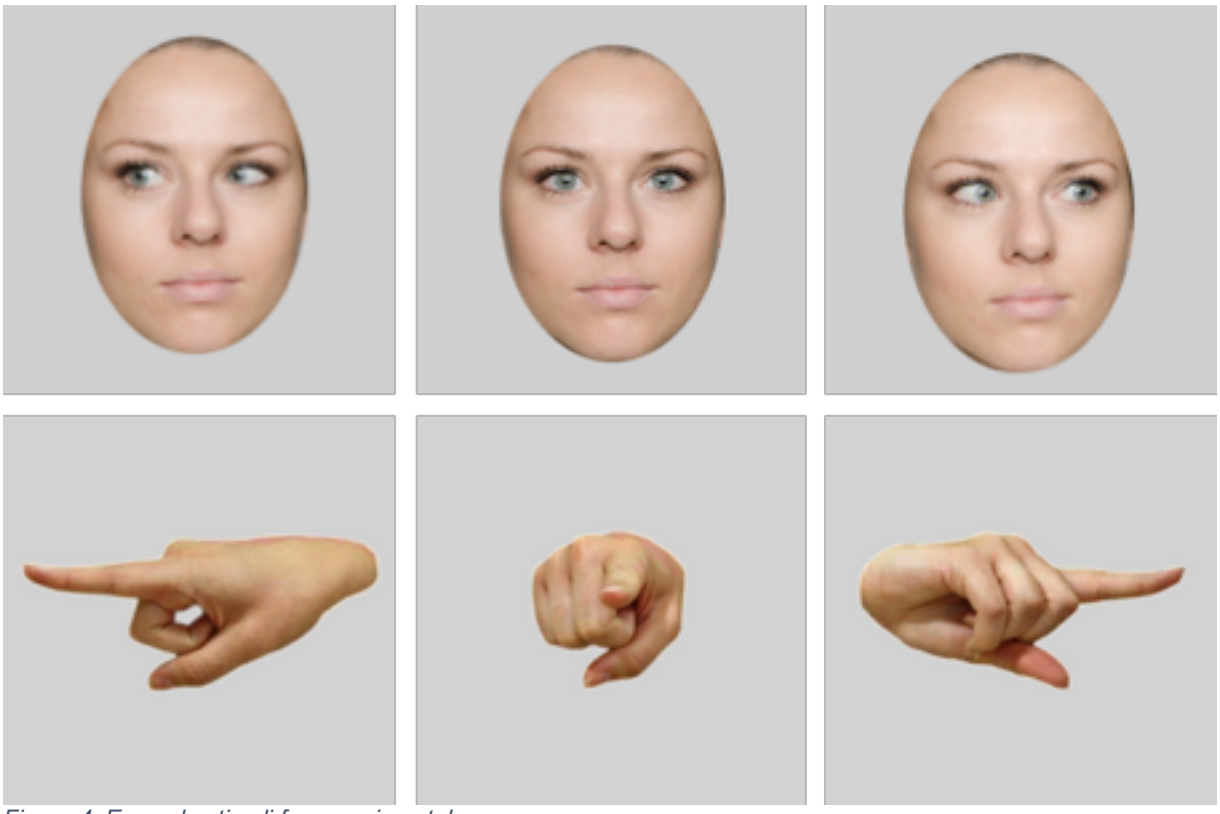


Figure 4: Example stimuli for experimental runs.

MRI Acquisition

All functional scans were collected using the same scanner and parameters: Siemens Magnetom Prisma 3T, 2.5-mm isotropic resolution with matrix size of 84×84 over 52 slices, TR = 1000ms, multi-band gradient-echo echoplanar pulse sequence. Anatomical scans were collected using T1-weighted 3D MPRAGE sequence with a matrix size of 248×256 over 176 1mm slices. More information about the scanner and facilities can be found at http://cfmm.robarts.ca/tools/3t-mri/.

Data Preprocessing

Data were preprocessed in Brain Voyager 20.6 commercial software. Preprocessing steps consisted of functional-anatomical alignment, three-dimensional motion correction, temporal high-pass filtering and transformation into 2-mm isotropic resolution, warping into stereotaxic space using the MNI-152 template.

Variants

Several variants of the localizer protocols were used to collect additional data. These variants provide concrete examples to explore the analytical effects of varying experimental design and conditions.

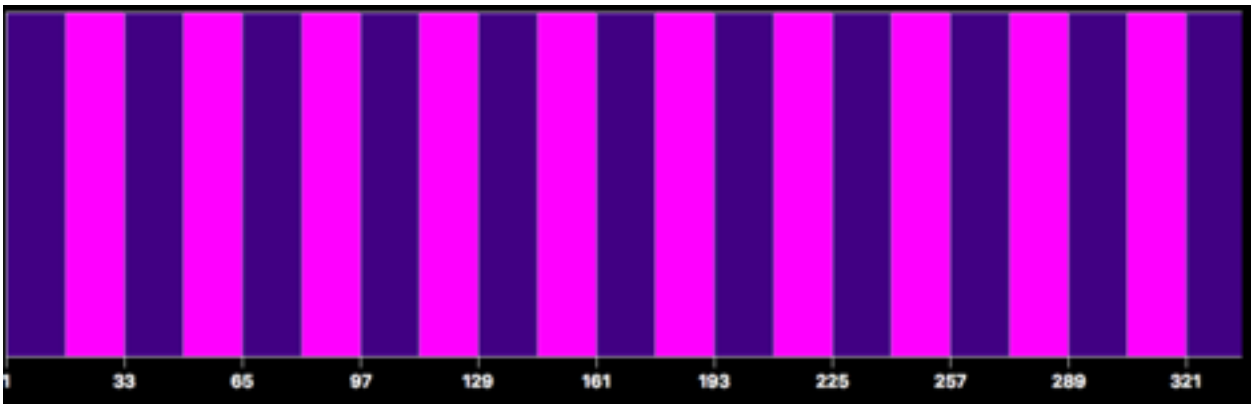
Variant 1 – Alternative (Suboptimal) Block Designs

The block design protocols for this variant use alternating blocks of faces and hands. In all cases, stimuli are presented for 0.8 s with an intertrial interval of 0.2 s. No baselines are used. Block duration ranges from 4 s to 64 s, and all seven run orders share a run duration of 336 s. All block design run orders are described by the following legend and figures.

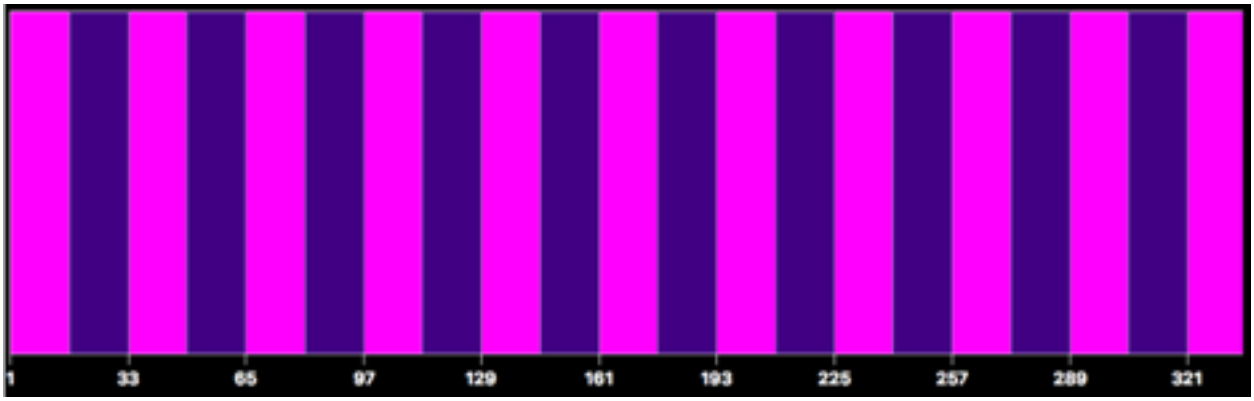
Hands

Faces

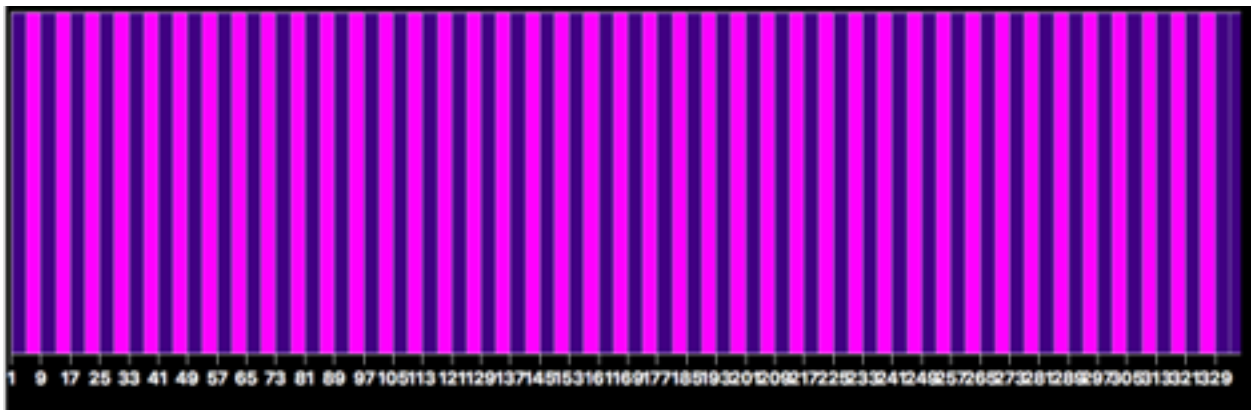
Order 1 – alternating 16 s blocks of hands and faces.



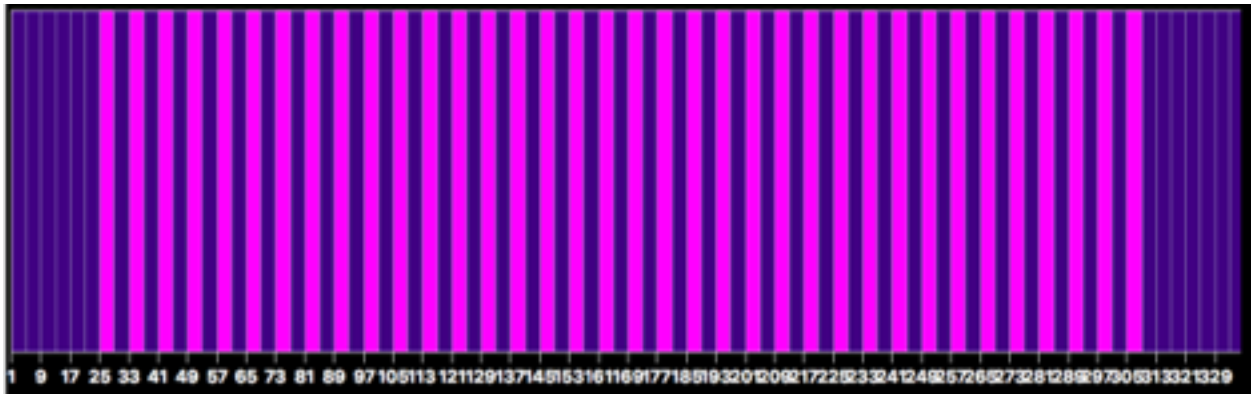
Order 2 – alternating 16 s blocks of faces and hands.



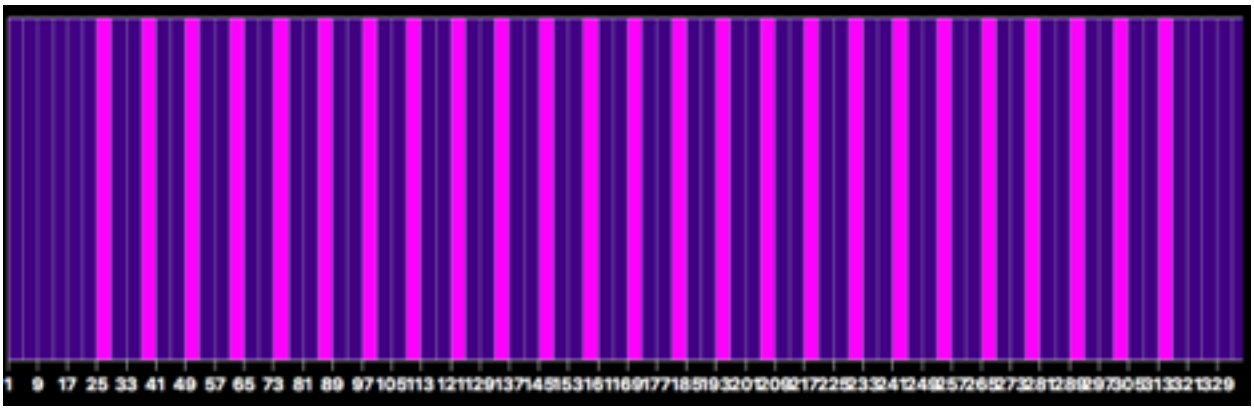
Order 3 – alternating 4 s blocks of hands and faces.



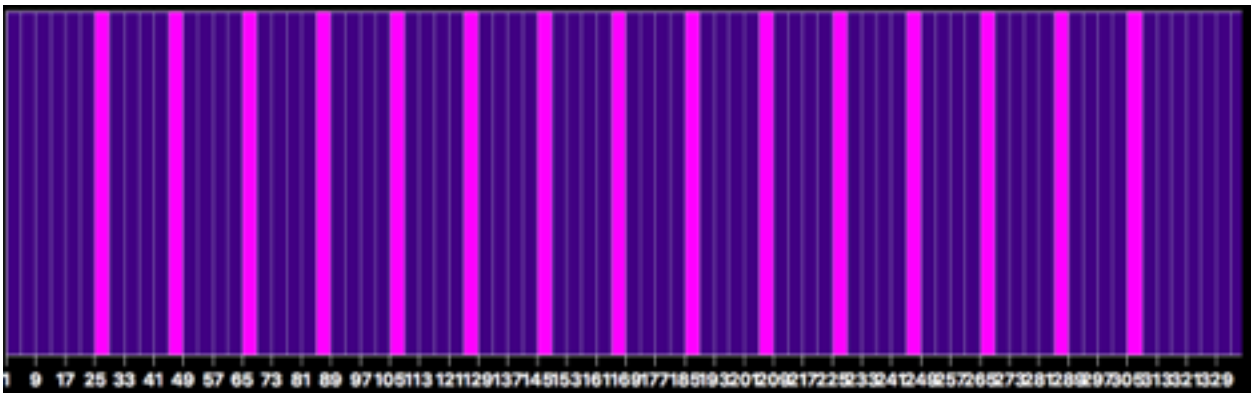
Order 4 – alternating 4 s blocks of hands and faces with starting and ending hand baselines.



Order 5 – alternating blocks of hands and faces with different block durations: hands (4 s) and faces (8 s) with starting and ending hand baselines.



Order 6 - alternating blocks of hands and faces with different block durations: hands (4 s) and faces (16 s) with starting and ending hand baselines.

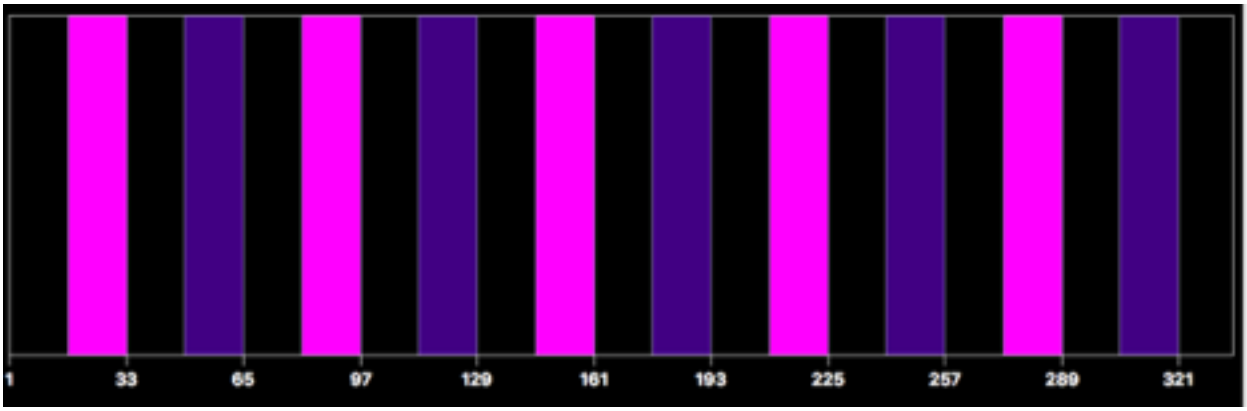


Order 7 – alternating blocks of hands and faces with long block duration (64 s) with ending hand baseline.

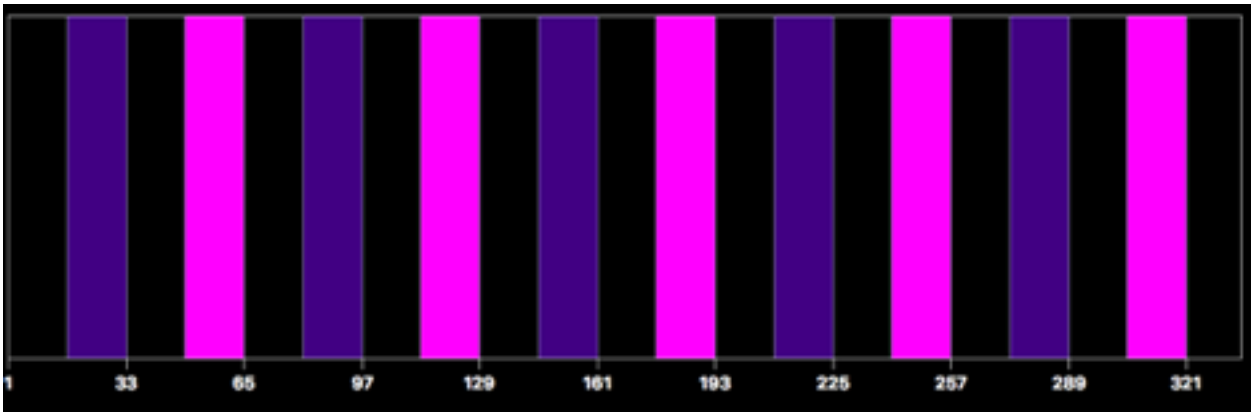
Variant 2 – Block and Slow Event-Related Designs with Baselines

This variant integrates baselines (stimulus-free periods) into four block design orders and three slow event related orders. Once again, stimuli are presented for 0.8 s with an intertrial interval of 0.2 s. Order durations vary.

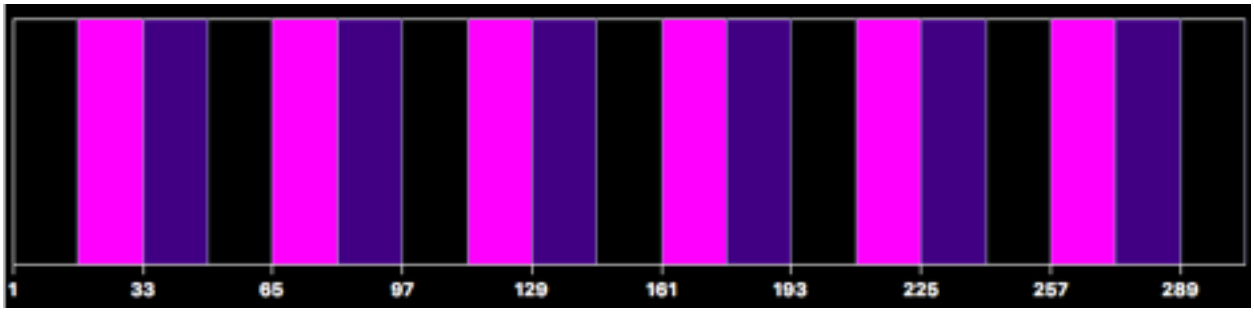
Order 1 – alternating blocks of baseline (16 s) and stimulus (16 s), where stimulus alternates between faces and hands, ending with additional baseline (16 s). Order duration is 336 s.



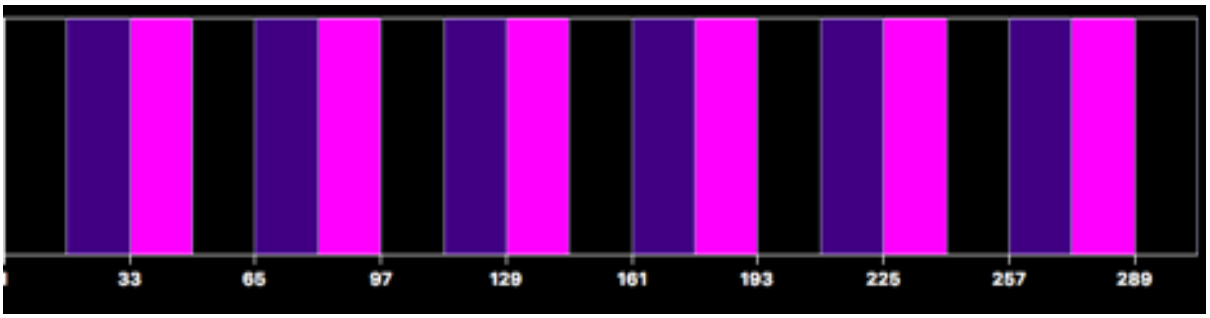
Order 2 - alternating blocks of baseline (16 s) and stimulus (16 s), where stimulus alternates between hands and faces, ending with additional baseline (16 s). Order duration is 336 s.



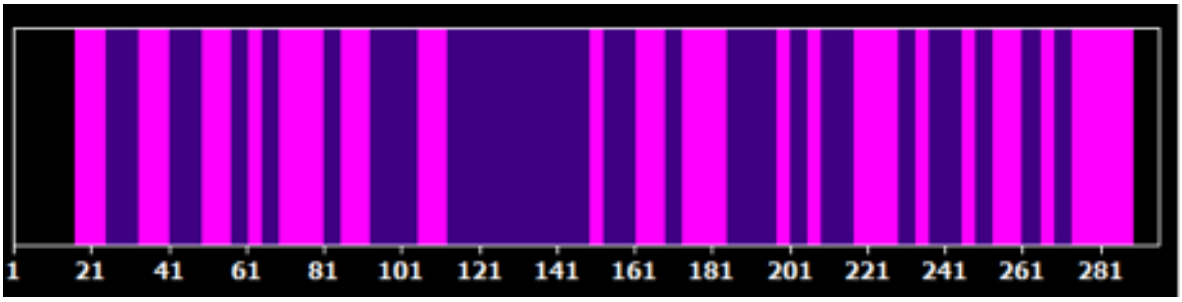
Order 3 – repeating blocks of baseline (16 s), faces (16 s), and hands (16 s), ending with additional baseline (16 s). Order duration is 304 s.



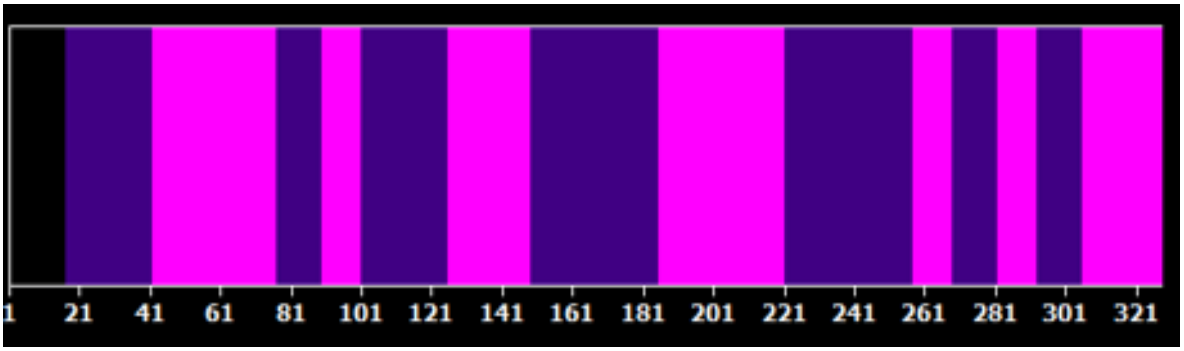
Order 4 – repeating blocks of baseline (16 s), hands (16 s), and faces (16 s), ending with additional baseline (16 s). Order duration is 304 s.



Order 5 – Slow Event Related.



Order 6 – Slow Event Related.



Order 7 – Slow Event Related.