Child gap prosaccade & child gap antisaccade

The Gap-overlap task (adapted from Elsabbagh, Fernandes et al. (2013)) is a gaze contingent paradigm that measures visual attention shifting between a central and a peripheral stimulus. This is thought to be a key sub process underlying behavioral control. The Gap-Overlap task contains three conditions; i) Gap, in which the central stimulus disappears 200ms before the appearance of the peripheral target; ii) Baseline, in which the central stimulus disappears simultaneously with the appearance of the peripheral target; iii) Overlap, in which the central stimulus remains on screen during peripheral target presentation.

This task can have a prosaccade instruction (i.e., look at the peripheral stimulus) and an antisaccade instruction (i.e., look at the opposite direction of where the stimulus appears). The antisaccade instruction more strongly reflects attentional inhibition. Key dependent variables: Latency to shift attention to the peripheral stimulus in the Gap vs Baseline conditions (Facilitation) and Gap vs Overlap conditions (Disengagement).

Stimulus

The Gap-Overlap task was based on Elsabbagh and colleagues (2013). Trials started with a clock (2.6° x 2.6°) expanding and contracting (maximum size 3.5° x 3.5°) at the center of the screen to attract the participant's attention. After the participant fixated the central stimulus, it started spinning with a speed of 500°/s to maintain the participant's attention. After 600-700 ms, a peripheral stimulus (a yellow oval, 2.6° x 2.6°) was presented at 19° to the left or right from the central stimulus. This 100 ms jitter in onset of the peripheral stimulus was

implemented to decrease anticipatory saccades. The task contained a gap, overlap, and baseline condition. In the gap condition, central stimulus offset was 200.2 ms on average (*sd* = 1.69 ms, range 196.67-216.67 ms) before peripheral stimulus onset. In the overlap condition, the central and peripheral stimulus remained simultaneously and inanimately on screen. In the baseline condition, the peripheral stimulus onset was at the same time as central stimulus offset. The peripheral stimulus stayed on screen until the participant fixated it or until 1500ms elapsed. Upon fixating the peripheral stimulus, or if 1500ms elapsed, the peripheral stimulus spun and contracted over 1000ms. This feedback was combined with various sounds (e.g., a car horn, a bell). The Gap-Overlap task consisted of 12 trials per condition, randomly presented.

Apparatus

A Tobii TX300 eye-tracker (Tobii Technology, Stockholm, Sweden) with an integrated 23-inch monitor (1920 by 1080 pixels; 60Hz refresh rate) was used to record eye movements. The Tobii TX300 ran at 300Hz and communicated with MATLAB (version R2015a, MathWorks Inc., USA) and the Psych-Toolbox (version 3.0.12, Brainard, 1997) running on a MacBook Pro (OS X 10.9) via the Tobii SDK.

Procedure

Participants were positioned at a distance of 65cm from the eye-tracker. A chin-rest was used to ensure the same distance and position throughout the experiment. Hereafter, an operator-controlled calibration was run, which consisting of colored expanding and contracting spirals presented at the four corners and the center of the screen. The spirals were accompanied by a sound. A web-cam was used to monitor the participant. When the operator judged the participant to be looking at the spiral, a button was pressed, after which the spiral

contracted and was calibrated. Details of the calibration stimuli are given in Hessels et al. (2015). The operator judged the calibration output from the Tobii SDK, after which a decision was made to accept the calibration or re-calibrate.

After the calibration was accepted, the gap-overlap task was started. Throughout the experiment, the participant was monitored through the web-cam. The task including calibration last approximately 10 to 15 minutes.The antisaccade version of the gap-overlap task will always follow the pro-saccade version of the task with a short break and a calibration in between. For the antisaccade version, children are instructed to first look at the clock and then look exactly at the opposite of where the peripheral stimulus appears. The area where they need to look is highlighted during the instructions. Neither speed nor accuracy are stressed. Understanding of the block instructions is verified by asking the child to verbally explain the instructions.

References:

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