

Supplementary information

We provide source code for simulations on the effect of labile saccade programs (Fig. 8), as well as simulations of the experiments/analyses by Yang and McConkie (2001; Supplementary Material Fig. 1), Staub et al. (2010; Supplementary Material Fig. 2), and Staub (2011; Supplementary Material Fig. 3). All simulations were implemented in MATLAB (The MathWorks, Natick, MA, USA) and can be found in a zip file (ICAT_MATLAB.zip). Furthermore, we make available simulations of both experiments described in the second half of the manuscript. Zip files (ICAT_EXP1; ICAT_EXP2) contain folders with ICAT incorporated into a model of eye guidance. The source code was written in the C programming language and needs to be compiled before execution.

ICAT_MATLAB contains four executable MATLAB-scripts (xICATdemoLabile.m, xICATdemoYM2001.m, xICATdemoStaub2010.m, xICATdemoStaub2011.m). Model parameters are specified at the beginning of each file. Each file calls a function “[fd canc]=simICAT(a,par)” passing two variables to the function. “a” represents the activation during a trial and is primarily determined by its maximal activation ($fc \cdot CMAX$) and the duration of processing (NA), “par” contains all parameters needed for the simulation. Parameters are commented in the MATLAB files so that they can be related to the actual model. The function generates two vectors containing fixation durations (“fd”) and the number of cancelations (“canc”) of the corresponding fixations. The plots from our manuscript are generated at the end of each file.

Simulations of both scanning experiments can be found in separate zip files containing the actual simulation as well as functions and data called by the simulation (ICAT_EXP1; ICAT_EXP2). In order to run the model, code in the file “astsim.c” must be compiled first. Model parameters are stored in a separate file (sd.par) and may be changed in the second column to test new parameter combinations. When running the compiled file, an output is generated summarizing model parameters as well as the results of the simulation. Furthermore, both simulations generate a file (out/simExp1.dat; out/simExp2.dat) containing a matrix with 13 columns:

1. Simulation (“Subject”)
2. Trial
3. Nth Fixation (during a trial)
4. Fixated symbol
5. Position of the gap (5 – simulated data)
6. Gap size of fixated stimulus (0 - small, 1 - large)
7. Condition (11 – low difficulty, 00 – high difficulty, 01 - decreasing difficulty, 10 – increasing difficulty)
8. Nth symbol relative to change
9. Fixation duration
10. Horizontal fixation position in degree visual angle
11. Vertical fixation position (not simulated)
12. Horizontal fixation position relative to symbol center
13. Vertical fixation position relative to symbol center (not simulated)