Coding sheet for

Increasing reward prospect promotes cognitive flexibility: Direct evidence from voluntary task switching with double registration

Kerstin Fröber[1], Roland Pfister[2] & Gesine Dreisbach[1]

[1] University of Regensburg, Germany

[2] Julius Maximilians University of Würzburg, Germany

Experiment 1 (RawDR_Exp1.txt)

Short description: 100 % free-choice trials with global instruction to perform both tasks about equally often and in random order; task choice was first indicated by a key press with the right hand, response to the following target stimulus was given with the left hand (double registration procedure); low and high reward changed randomly from trial to trial resulting in four different reward sequences (remain low, increase, remain high, decrease).

Experiment 2

Short description: Same procedure as in Experiment 1 except that not task choice (numbers or letters) was preregistered in the double registration procedure but task transition (repeat or switch).

Experiment 3

Short description: 80 % forced-choice trials and 20 % free-choice trials; no restrictions on task choice in free-choice trials; task choice in free-choice trials was indicated as in Experiment 1, but in forced-choice trials a pre-determined task had to be "activated"; low and high reward changed randomly from trial to trial; free-choice trials were always high reward trials, either increase or remain high.

Experiment 4

Short description: Same procedure as in Experiment 3 except that task choice required a joystick movement.

Experiment 5

Short description: Same procedure as in Experiment 3 except that task choice required a mouse movement.

Variables in Experiment 1 (RawDR_Exp1.txt)

- Subject: participant ID
- Choice.RT: reaction time in ms to the task choice prompt

- Mode: Practice = single task and task switching practice blocks, Baseline = no reward block for determination of individual response thresholds, Test = reward block
- RewN: reward in Trial N; 1 = low reward, 2 = high reward
- RSeq: reward sequence; 1 = remain low, 2 = increase, 3 = remain high, 4 = decrease
- Target.ACC: target response accuracy; 1 = correct response, 0 = error
- Target.RT: target reaction time in ms
- Task: chosen task in a given trial; A1 = number task, A2 = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TaskChoice: chosen task in a given trial; Zahlen = number task, Buchstaben = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- Trialnr: current trial number in a given block
- Transition: task transition from trial N-1 to trial N; NaN = not applicable (first trial of a block), r = repetition, s = switch

Variables in Experiment 2 (RawDR_Exp2.txt)

- Subject: participant ID
- Choice.RT: reaction time in ms to the transition choice prompt; there is no CRT on the first trial in a given block because here the task was determined randomly by the computer
- Mode: Practice = single task and task switching practice blocks, Baseline = no reward blocks for determination of individual response thresholds, Test = reward blocks
- RewN: reward in Trial N; 1 = low reward, 2 = high reward
- RSeq: reward sequence; 1 = remain low, 2 = increase, 3 = remain high, 4 = decrease
- Target.ACC: target response accuracy; 1 = correct response, 0 = error
- Target.RT: target reaction time in ms
- Task: chosen task in a given trial; A1 = number task, A2 = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TaskChoice: chosen task in a given trial; Zahlen = number task, Buchstaben = letter task; task in free-choice trials was coded based on the transition choice indicated with the right hand prior to target presentation
- Transition: task transition from trial N-1 to trial N; NaN = not applicable (first trial of a block), r = repetition, s = switch
- Trialnr: current trial number in a given block

Variables in Experiment 3 (RawDR_Exp3.txt)

- Subject: participant ID
- TrialType: 1 = forced-choice, 2 = free-choice
- Choice.RT: reaction time in ms to the task choice prompt

- Mode: Practice = single task and task switching practice blocks, Baseline = no reward block for determination of individual response thresholds, Test = reward block
- RewN: reward in Trial N; 1 = low reward, 2 = high reward
- RSeq: reward sequence; 1 = remain low, 2 = increase, 3 = remain high, 4 = decrease
- Target.ACC: target response accuracy; 1 = correct response, 0 = error
- Target.RT: target reaction time in ms
- Task: pre-determined or chosen task in a given trial; A1 = number task, A2 = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TaskChoice: pre-determined or chosen task in a given trial; Zahlen = number task, Buchstaben = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TrialNr: current trial number in a given block
- Transition: task transition from trial N-1 to trial N; 1 = repetition, 2 = switch; Transition was coded based on the variable Task

Variables in Experiment 4 (RawDR_Exp4.txt)

- Subject: participant ID
- TrialType: 1 = forced-choice, 2 = free-choice
- Choice.RT: reaction time in ms to the task choice prompt
- Mode: Practice = single task and task switching practice blocks, Baseline = no reward block for determination of individual response thresholds, Test = reward block
- RewN: reward in Trial N; 1 = low reward, 2 = high reward
- RSeq: reward sequence; 1 = remain low, 2 = increase, 3 = remain high, 4 = decrease
- Target.ACC: target response accuracy; 1 = correct response, 0 = error
- Target.RT: target reaction time in ms
- Task: pre-determined or chosen task in a given trial; A1 = number task, A2 = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TaskChoice: pre-determined or chosen task in a given trial; Zahlen = number task, Buchstaben = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- TrialNr: current trial number in a given block
- Transition: task transition from trial N-1 to trial N; 1 = repetition, 2 = switch; Transition was coded based on the variable Task

Variables in Experiment 5 (RawDR_Exp5.txt)

- Subject: participant ID
- Choice.RT: reaction time in ms to the task choice prompt
- TrialType: 1 = forced-choice, 2 = free-choice

- TaskChoice: pre-determined or chosen task in a given trial; 1 = number task, 2 = letter task; task in free-choice trials was coded based on the task choice indicated with the right hand prior to target presentation
- Mode: Practice = single task and task switching practice blocks, Baseline = no reward block for determination of individual response thresholds, Test = reward block
- RewN: reward in Trial N; 1 = low reward, 2 = high reward
- RSeq: reward sequence; 1 = remain low, 2 = increase, 3 = remain high, 4 = decrease
- Target.ACC: target response accuracy; 1 = correct response, 0 = error
- Target.RT: target reaction time in ms
- TrialNr: current trial number in a given block
- Transition: task transition from trial N-1 to trial N; 1 = repetition, 2 = switch; Transition was coded based on the variable Task
- x0-x100: x-coordinates of the mouse cursor (in pixels) at each timestep of the normalized movement trajectories
- y0-y100: y--coordinates of the mouse cursor (in pixels) at each timestep of the normalized movement trajectories
- AD0-AD100: absolute distance in pixels for the time-normalized 101 steps from leaving the home area to reaching the target area