

Quick start guide Chessboardtask (2016_v13) (doc v.Oct 20 2016)

Thanks for your interest in the Chessboardtask. You are free to use this test for research purposes. Read the step by step instruction below on how to use the task:

1. Unzip file (task is not tested on Mac, so only use on PC; note: if the game version has a low framerate you should use a more powerful PC/better graphics card)
2. Next you see Unity exe file (this can be used to start the task) and the “Chessboardtask 2016_Data” folder (in this folder there is another folder named “output”, this is where you’ll find the output files; we advise you to open these files using Excel for optimal readability).
3. Open the Unity exe file
4. Next you get an pop-up screen:

Screen resolution: Best is to use the 1920x1080 resolution (else, parts of the task might fall outside the screen [you can also try what works best]; if you like you can also open the task within a window).

Click “Play!”

5. The main menu:

Chessboardtask

EN

This input will be reported in the output file and/or in the name of the output file.

You can fill in anything/any number you like, this will not impact how the task is presented (e.g. the tasknumber can be used when one player performs multiple tasks, to keep track of the order in which the tasks were presented; this number will be reported in the output).

However, if you do the same task twice make sure you change the username (e.g. Sebastiaan2), the testsubject number, or the tasknumber, before you start, otherwise the existing output file will be overwritten (because the new file will get the same name as the older one).

Username:

Sebastiaan

Testsubject number:

22

Tasknumber:

1

Task:

Complex Chessboardtask Game

start

Settings. Here you can change the number of experimental trials for each task (note: for most tasks the minimum number of trials is 10 or 12).

Credits

Language selection (choose between English and Dutch). The language that is selected also determines which currency is shown in the monetary versions of the tasks. In the Dutch version the player is presented with 10 euros and in the English version the player is presented with 10 dollars.

Select the task you like:

Note: The upgrades that are earned in the game versions are saved as long as you don't close the entire program. This is done to enable the consecutive presentation of the game versions of both working memory tasks (standard and complex), without losing the upgrades made by the player.

For example, if the player finishes the game version of the standard task, the upgrades will not be lost when she/he goes back to the main menu (using ctrl + F11), and continue with the game version of the complex task (in fact, at the start of the second game Mamma Mia will mention that the player helped here before). Just try it out.

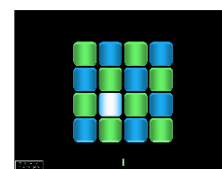
6. Controls:

- The task is operated by mouse or (if available) by touchscreen.
- **To quit** a task before it ends and go back to the main menu press “ctrl key + F11 key”, to quit the program from the main menu press “ctrl key + F11 key”.

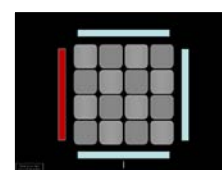
- **To skip a practice block** press “ctrl key + Enter key”.
- In the game versions there is **background music** during the trials. The volume of this music can be adjusted by pressing – or + (less loud or louder resp.) on the numpad.

7. Under “Task” you can select one of the following tasks (for reference list visit www.SebastiaanDovis.com or see below):

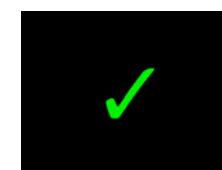
Standard Chessboardtask NF (no-feedback): the standard version of the Chessboardtask (as described in Dovis et al., 2012; 2013; 2015a; 2015b) but without direct feedback during the experimental trials. In this task there is only feedback during the practice trials.



Complex Chessboardtask NF (no-feedback): a new, more complex version of the Chessboardtask (Dovis et al., in prep; also see description below) without direct feedback during the experimental trials. In this task there is only feedback during the practice trials.

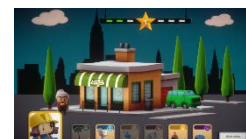


Standard Chessboardtask FO (feedback-only): the standard version of the Chessboardtask (as described in Dovis et al., 2012; 2013; 2015a; 2015b) with direct feedback during the practice and experimental trials.

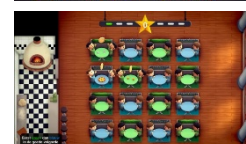


Complex Chessboardtask FO (feedback-only): a new, more complex version of the Chessboardtask (Dovis et al., in prep; also see description below) with direct feedback during the practice and experimental trials.

Standard Chessboardtask Game (gamified version): a gamified version of the Chessboardtask (as described in Dovis et al., 2012; 2013; 2015a; 2015b).



Complex Chessboardtask Game (gamified version): a gamified and new, more complex version of the Chessboardtask (Dovis et al., in prep; also see description below).



Standard Chessboardtask 10E (child): the 10 euro/10 dollar version of the Chessboardtask (as described in Dovis et al., 2012; 2013; 2015a; 2015b) with direct feedback during the practice and experimental trials.



Complex Chessboardtask 10E (child): a 10 euro/10 dollar version of the new, more complex version of the Chessboardtask (Dovis et al., in prep; also see description below) with direct feedback during the practice and experimental trials.



Complex Chessboardtask 10E (adult): an adult 10 euro/10 dollar version of the new, more complex version of the Chessboardtask (Dovis et al., in prep; also see description below) with direct feedback during the practice and experimental trials. Difference between the child and adult version is in the instruction and in the way the money is presented (e.g. in the 10 euro/dollar child version there are 10 euro coins/dollar bills presented, whereas this is presented as a single 10 euro/dollar bill).



8. **Output:** there is a folder named “output”, this is where you’ll find the output files; we advise you to open these files using Excel for optimal readability). For documentation on how to calculate the scores of the complex Chessboardtask please contact Sebastiaan Dovis.

| | A | B | C | D | E | F | G | H | I |
|----|---|---------|---------------|-----------|---------------|------------|----------------|--------|-------|
| 1 | Task: Simple chessboardtask (game) | | | | | | | | |
| 2 | ppname: Sebastiaan Dovis - pprnr: 1 - tasknr: 1 | | | | | | | | |
| 3 | date/starttime: 18 October 2016 10:19 | | | | | | | | |
| 4 | Bloknr | trialNr | TrialStartTij | seqlength | presented s | sequenceco | pressed_sec | amount | wrong |
| 5 | 1 | 1 | 72 | 2 | 10, 16 | BG | 16, 10 | | 0 |
| 6 | 1 | 2 | 95 | 2 | 12, 3 | BG | 3, 12 | | 0 |
| 7 | 1 | 3 | 110 | 3 | 4, 12, 14 | BBG | 14, 4, 12 | | 0 |
| 8 | 1 | 4 | 139 | 3 | 13, 11, 10 | BGB | 11, 13, 10 | | 0 |
| 9 | 2 | 1 | 249 | 3 | 13, 11, 5 | BGB | 11, 13, 5 | | 0 |
| 10 | 2 | 2 | 266 | 3 | 5, 4, 6 | BBG | 6, 5, 4 | | 0 |
| 11 | 2 | 3 | 281 | 4 | 15, 15, 5, 1 | BBBG | 14, 15, 15, 1 | | 0 |
| 12 | 2 | 4 | 301 | 4 | 4, 5, 8, 9 | BBGG | 8, 9, 5, 4 | | 0 |
| 13 | 2 | 5 | 320 | 4 | 12, 6, 13, 1 | BGBB | 6, 12, 13, 1 | | 0 |
| 14 | 2 | 6 | 367 | 4 | 4, 16, 11, 1 | BGGG | 16, 11, 4, 1 | | 0 |
| 15 | 2 | 7 | 388 | 4 | 12, 12, 14 | BBGB | 14, 12, 12 | | 0 |
| 16 | 2 | 8 | 407 | 4 | 4, 8, 12, 12 | BGBB | 8, 4, 12, 12 | | 0 |
| 17 | 2 | 9 | 426 | 5 | 4, 8, 11, 7 | BGBGB | 8, 11, 3, 4, 7 | | 0 |
| 18 | 2 | 10 | 446 | 5 | 9, 10, 6, 5 | BGBBB | 9, 6, 10, 5 | | 0 |
| 19 | 2 | 11 | 500 | 6 | 15, 15, 14 | BBGGBG | 14, 9, 8, 15 | | 0 |
| 20 | 2 | 12 | 527 | 6 | 8, 5, 11, 7 | BGBBBG | 8, 11, 3, 10 | | 0 |
| 21 | 2 | 13 | 551 | 5 | 9, 12, 8, 10 | BGBGB | 9, 8, 3, 12 | | 0 |
| 22 | 2 | 14 | 570 | 5 | 5, 1, 10, 14 | BGBBB | 1, 14, 5, 10 | | 0 |
| 23 | 2 | 15 | 591 | 6 | 15, 3, 15, 1 | BGBBGB | 3, 14, 16, 1 | | 0 |
| 24 | 2 | 16 | 641 | 6 | 4, 13, 16, 9 | BBGGGB | 16, 9, 9, 13 | | 0 |
| 25 | 2 | 17 | 665 | 5 | 4, 5, 8, 11 | BBGGG | 8, 11, 1, 4 | | 0 |
| 26 | 2 | 18 | 687 | 5 | 11, 12, 10 | BGBBB | 11, 8, 12, 10 | | 0 |
| 27 | 2 | 19 | 707 | 6 | 5, 15, 7, 1 | BBBGGG | 1, 11, 8, 5 | | 0 |
| 28 | 2 | 20 | 729 | 6 | 7, 7, 5, 11 | BBBGGG | 11, 16, 6, 7 | | 0 |
| 29 | 2 | 21 | 784 | 5 | 5, 10, 9, 12 | BGBBG | 9, 6, 5, 10 | | 0 |
| 30 | 2 | 22 | 804 | 5 | 16, 7, 5, 11 | BGBBB | 16, 11, 7, 5 | | 0 |
| 31 | 2 | 23 | 824 | 6 | 4, 3, 4, 6, 1 | BGBBGB | 3, 9, 14, 14 | | 2 |
| 32 | 2 | 24 | 848 | 6 | 2, 11, 15, 1 | BGBBGB | 11, 1, 9, 2 | | 0 |
| 33 | 2 | 25 | 871 | 6 | 8, 6, 12, 13 | BGBBGB | 8, 6, 1, 12 | | 0 |
| 34 | date/endtime: 18 October 2016 10:32 | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |

The working memory score is based on the mean sequence length of trial 10 until the last trial: After the practice block (bloknr 1) the task starts at a easy level (a sequence of three stimuli), and because the difficulty level of the task adapts gradually (after two consecutive correct/incorrect reproductions the sequence is increased/decreased by one stimulus), children typically need the first 10 trials to reach their optimal difficulty level (a sequence length higher than 5 or 6 stimuli). Since the mean of these first 10 trials gives no relevant information on individual performance, and inclusion of these trials results in a more inaccurate representation of participant's working memory capacity, these first trials are excluded from analysis; see also Dovis et al., 2012).

Misc.

For questions, testprocedures (information on how to present the tasks to children or adults), norms, additional translations, other adjustments to the task, reports of bugs, research cooperation's, or anything else, please contact Sebastiaan Dovis (s.dovis@uva.nl).

Also, we have some first norms (although only of about 60-74 typically developing children for most tasks), but we love to improve these. So please contact us if you are interested in improving the norms of the Chessboardtask (s.dovis@uva.nl).

Description of complex Chessboardtask (but also, just try it out):

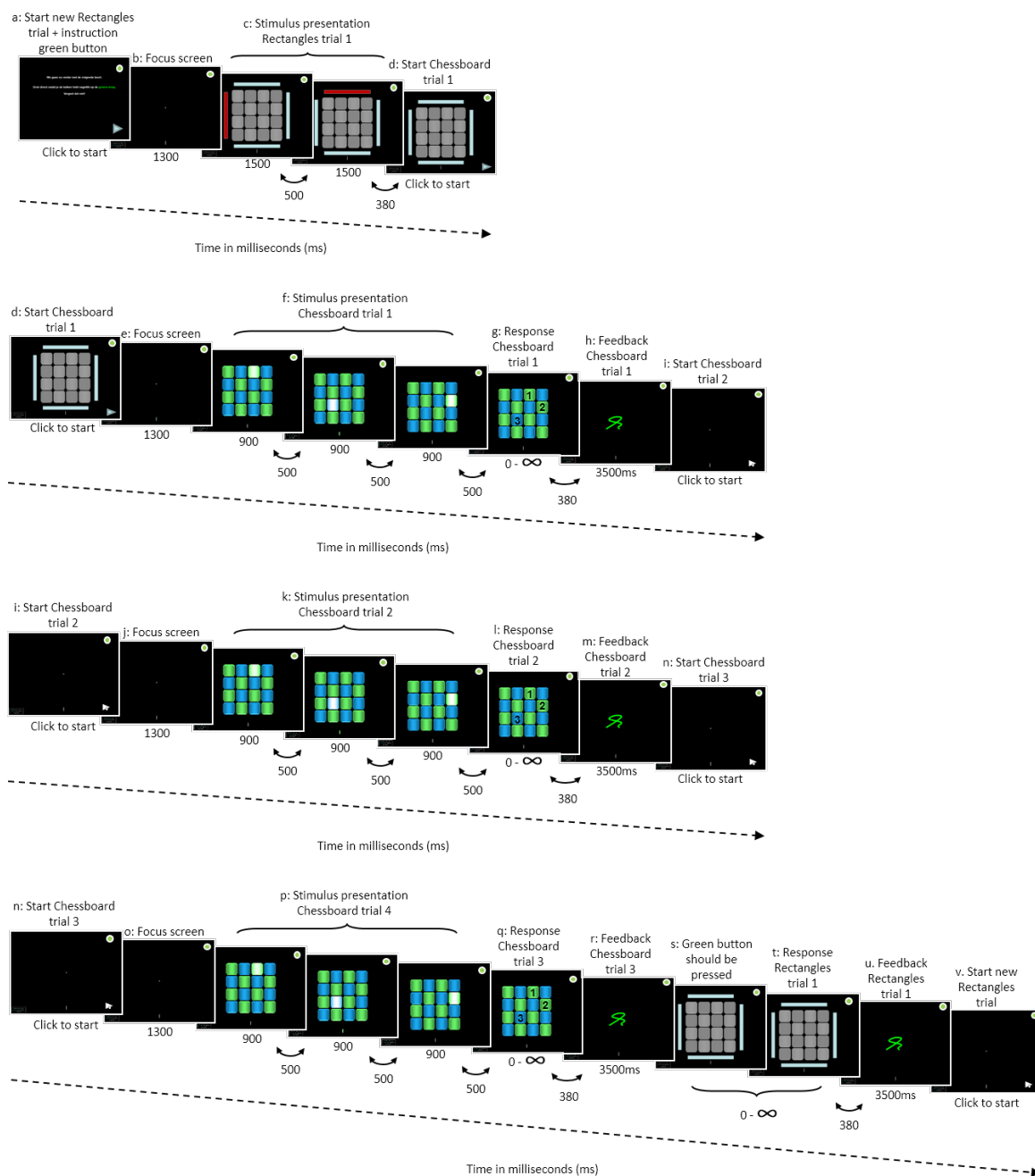


Fig 1. Four experimental trials on the no-feedback version of the Complex Chessboard task. (a) The green-button reminder is shown, and the arrowhead-button in the right-bottom corner has to be clicked to start the rectangle trial. (b) Then the focus screen is presented. (c) First, the first sequence of stimuli (two rectangles that light up) is presented. (d) Subsequently, the arrowhead-button can be clicked to start the first chessboard trial, (f) after a focus screen, a colored grid appears; showing green and blue squares ordered in a chessboard formation; then a sequence of stimuli (squares that light up) is presented one by one. Each stimulus lights up for 900ms and is followed by an inter-stimulus interval of 500ms. (g) After this sequence of green and blue

stimuli is presented the participant responds by mouse-clicking on the squares. To respond correctly the presented stimuli have to be reproduced in a reorganized way: The green stimuli have to be reproduced before the blue stimuli; both in the same order as presented (the numbers in picture g. show an example of a correct reorganization). (h) After the response, feedback is presented. (i) After feedback-presentation, the participant can start the second chessboard trial by clicking on the arrowhead button. (n) After this trial, the participant can start the third chessboard trial by clicking on the arrowhead button. (s) After this third chessboard trial, the grid turns grey and the rectangles reappear; the participant should press the green button before he reproduces the rectangles (this is the only moment that pressing the green button is correct). Only if the green button is pressed at the correct time the player gets immediate feedback (button turns bright green). (t) Next, the participant has to reproduce the stimulus presentation of the rectangles trial (see c) in the same order as presented. (u) After the response, feedback for the rectangles and the green button is presented. (v) Next, the participant can click the arrowhead-button to continue to a (the next trial).

References

Dovis, S., Van der Oord, S., Boendermaker, W., & Prins, P. J. M. (in prep.). Assessing Executive Functions through Gaming: Development and pilot evaluation of an innovative diagnostic tool for children and adolescents with ADHD and cognitive control problems.

Dovis, S., Van der Oord, S., Huizenga, H.M., Wiers, R.W., & Prins, P.J.M. (2015a). Prevalence and diagnostic validity of motivational impairments and deficits in visuospatial short-term memory and working memory in ADHD subtypes. *European Child & Adolescent Psychiatry*, 24 (5), 575-590 ([available online](#)).

Dovis, S., Van der Oord, S., Wiers, R.W., & Prins, P.J.M. (2015b). ADHD subtype differences in reinforcement sensitivity and visuospatial working memory. *Journal of Clinical Child & Adolescent Psychology*, 44 (5), 859-874 ([available online](#)).

Dovis, S., Van der Oord, S., Wiers, R.W., & Prins, P.J.M. (2013). What part of working memory is not working in ADHD? Short-term memory, the central executive and effects of reinforcement. *Journal of Abnormal Child Psychology*, 41 (6), 901-917 ([available online](#)).

Dovis, S., Van der Oord, S., Wiers, R.W., & Prins, P.J.M. (2012). Can motivation normalize working memory and task persistence in children with Attention Deficit/Hyperactivity Disorder? The effects of money and computer gaming. *Journal of Abnormal Child Psychology*, 40 (5), 669-681 ([available online](#)).